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U.S. ENVIRONMENTAL PROTECTION AGENCY

TECHNICAL ENFORCEMENT SUPPORT
AT
HAZARDOUS WASTE SITES

CONTRACT NO. 68-W9-0007
TES X

Metcalf & Eddy, Inc.



**ENVIRONMENTAL PROTECTION AGENCY
TECHNICAL ENFORCEMENT SUPPORT
AT
HAZARDOUS WASTE SITES**

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REML SECTION

TES X

**CONTRACT NO 68-W9-0007
WORK ASSIGNMENT # C07002
EPA SS/ID NO. 7PL4**

**REVIEW OF WOODWARD-CLYDE CONSULTANTS
SEPTEMBER 1992 QUARTERLY
GROUNDWATER MONITORING REPORT
AT
ORTHO-CHEVRON CHEMICAL COMPANY
IN
MARYLAND HEIGHTS, MISSOURI**

U.S.EPA REGION VII

**METCALF & EDDY, INC.
PROJECT NUMBER: 270002.0002.003**

**WORK PERFORMED BY:
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PROJECT NUMBER: TC-4802

March 9, 1993

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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Work Assignment Manager (WAM) requested the Technical Enforcement Support (TES) X Contractor to review the Woodward-Clyde Consultants (WCC) September 1992 Quarterly Groundwater Monitoring Report for the Chevron Chemical facility in Maryland Heights, Missouri. This report also includes Chevron's data for the initial sampling of well OWC-29 in August 1992. This review was performed as part of the tasks assigned under the TES X Contract Number 68-W9-0007, Work Assignment C07002.

In September 1992, groundwater samples were collected by WCC at the Ortho-Chevron facility. Sample splits were not collected for the U.S. EPA during this sampling event, nor was oversight performed. However, split samples were collected by the TES X Contractor for the U.S. EPA from well OWC-29 during its initial sampling in August 1992. The samples from well OWC-29 were analyzed by the U.S. EPA Region VII Laboratory for volatile organic compounds (VOCs), semi-volatile organic compounds (also referred to as Base/Neutral/Acids or BNAs), pesticides, herbicides, total metals, and dissolved metals in accordance with the U.S. EPA approved QAPjP for this site. For information on the sampling and review of the U.S. EPA split samples from well OWC-29, refer to TES X reports dated September 8, 1992 and January 7, 1993.

Prior to 1992, wells OWC-3, OWC-4, OWC-6, OWC-8, OWC-9, OWC-13 and OWC-23 had not been sampled since the early 1980s. With the exception of well OWC-13, these wells were returned to the monitoring network for sampling in 1992 at the recommendation of the U.S. EPA. Chevron agreed to add well OWC-9 for semi-annual sampling. The other wells were added to the monitoring network for three consecutive quarterly sampling events (June, September, and December 1992). In September, WCC elected to analyze samples from well OWC-13 rather than nearby well OWC-19, which had normally been sampled. The December sampling event occurred from December 8 through 10; U.S. EPA splits were collected at that time, and the data will be reviewed at a later date. Based on review of the data from these wells, permanent additions to the monitoring network may be made.

2.0 DISCUSSION OF ANALYTICAL DATA

In order to facilitate a comparison of the data presented in the WCC Annual Groundwater Monitoring Report and the data from the U.S. EPA June 1992 split samples with the data from previous years, the TES X Contractor prepared summary tables for each well showing minimum and maximum concentrations of contaminants of concern. These tables, located in Appendix A, are based on available data from 1981 to the present, included in the WCC Site Characterization Report (February 1988), various Annual (or Quarterly) Groundwater Monitoring Reports, the April 1991 WCC Report on the Fate and Transport of Lindane, and from the ESAT or U.S. EPA Region VII Laboratory reports on the U.S. EPA split samples collected in 1990, 1991, and 1992. These data represent Ortho-Chevron information that was readily available to the TES X Contractor and may not be complete. These tables are continually revised as more data become available. Beginning with selected wells in December 1990, WCC has indicated that VOC samples were analyzed for the Target Compound List (TCL); however, only xylenes and compounds detected are listed in their tables. Detection limits are provided only when a compound was detected in another well listed on that table. Thus, TCL compounds that are not

on WCC's analytical data summary tables are shown on the historical tables as being undetected, but detection limits are not known. This same assumption is made for the September 1992 data, although it is not clear from the WCC report whether TCL compounds not listed in their tables were analyzed but not detected.

The following is a brief summary of the data for each well.

Well OWC-1 The September 1992 analyses indicate that no contaminants were identified in this upgradient, shallow well. Historically, traces of lindane were detected in 1981 through 1983, and 1987 through 1989 at concentrations up to 1.4 $\mu\text{g}/\ell$ (1982 and 1987). Aldrin was detected at 0.40 $\mu\text{g}/\ell$ in 1987, xylene was reported at 2.1 $\mu\text{g}/\ell$ in 1984, and total arsenic was detected between 1981 and 1984 at a range of 0.4 to 10 $\mu\text{g}/\ell$.

Well OWC-2 In September 1992, arsenic was detected at 27 $\mu\text{g}/\ell$, an increase from the 13 $\mu\text{g}/\ell$ previously detected in 1992. No other contaminants were detected in this deep upgradient well in 1992.

In 1990, total arsenic had been detected at 320 $\mu\text{g}/\ell$. No dissolved arsenic was detected in 1990, the only year which dissolved arsenic was analyzed. In December 1991, alpha-benzene hexachloride (BHC) was detected at a concentration 0.059 $\mu\text{g}/\ell$ and total arsenic was detected at 59 $\mu\text{g}/\ell$. The only volatile organic compound detected from this well was in 1990, when carbon disulfide was detected at 15 $\mu\text{g}/\ell$.

From 1981 to 1983, the only other years for which data are available, lindane was detected at levels up to 6.41 $\mu\text{g}/\ell$, and total arsenic was detected at concentrations up to 1.2 $\mu\text{g}/\ell$. Dieldrin was detected in 1982 at range of 0.24 to 0.40 $\mu\text{g}/\ell$, and in 1983 aldrin was detected at 0.32 $\mu\text{g}/\ell$.

Well OWC-3 This shallow well is located along the southern edge of the site. In September 1992, lindane was detected at 3 $\mu\text{g}/\ell$, an increase from the previous 1992 maximum of 1.4 $\mu\text{g}/\ell$; both the maximum and minimum (0.66 $\mu\text{g}/\ell$) concentrations detected in 1992 are well above the Maximum Contaminant Level (MCL) of 0.2 $\mu\text{g}/\ell$ for lindane. In September 1992, alpha-BHC was detected at a new maximum concentration of 0.68 $\mu\text{g}/\ell$, up from the previous maximum of 0.32 $\mu\text{g}/\ell$; no data are available for the years 1982 through 1991. In 1981, this well contained a minimum concentration of 0.3 $\mu\text{g}/\ell$ and a maximum of 1.07 $\mu\text{g}/\ell$ of lindane. At that time, diazinon was detected at 1.7 $\mu\text{g}/\ell$ and total arsenic was detected at 24 $\mu\text{g}/\ell$.

The only VOC detected in September 1992 was 2-butanone (also referred to as methyl ethyl ketone or MEK). This VOC is a common laboratory contaminant and was detected at 11 $\mu\text{g}/\ell$.

Chevron has typically considered this well to be "upgradient"; however, the presence of lindane suggests that there is a component of the groundwater flow in this direction. This was discussed in greater detail in the June 9, 1992 TES X review of the March 1992 groundwater data.

Well OWC-4

This shallow well is located along the southern edge of the site and was added to the monitoring network in 1992 due to the presence of trichloroethene (TCE) in the adjacent deep well, OWC-20. Chevron has referred to this as an "upgradient well"; however the abundance of contaminants present suggests that it has been affected by a component of groundwater flow from the highly contaminated central portion of the site.

In September 1992, TCE was detected at 91 $\mu\text{g}/\ell$, which is within the previous 1992 range of 75 to 110 $\mu\text{g}/\ell$. The only other compounds detected in September 1992 were beta-BHC at 8.1 $\mu\text{g}/\ell$, and delta-BHC at 1 $\mu\text{g}/\ell$. The beta-BHC concentration is slightly higher than the previous maximum of 6.4 $\mu\text{g}/\ell$, while the delta-BHC concentration is identical to the previously established minimum.

Previously in 1992, the following were detected in either the WCC or June 1992 U.S. EPA split sample: the herbicide, 2,4-D; the pesticides lindane (and the BHC isomers), dieldrin, endrin ketone, heptachlor epoxide, and methoxychlor; and the volatile organic compound, TCE. In view of the pesticide and herbicide contamination, it is impossible to conclude that the TCE contamination was not derived from the Chevron facility. TCE was detected at a range of 75 to 110 $\mu\text{g}/\ell$ by WCC, and at 120 $\mu\text{g}/\ell$ in the EPA split sample.

Though not detected in September, 2,4-D had been detected at a concentration of 1.2 $\mu\text{g}/\ell$ in the WCC sample and at 1.3 $\mu\text{g}/\ell$ in the U.S. EPA split sample from June 1992.

Lindane had been detected at a concentration of 0.3 $\mu\text{g}/\ell$ (March 1992); both the WCC and EPA samples were nondetect at approximately 0.5 $\mu\text{g}/\ell$ in June 1992. Beta-BHC was detected at 3.3 $\mu\text{g}/\ell$ in March and 6.4 $\mu\text{g}/\ell$ in June in the WCC sample, and at 7.2 $\mu\text{g}/\ell$ in the June EPA sample. Delta-BHC was detected at 0.87 $\mu\text{g}/\ell$ in the June EPA split, and at 1.0 (June) to 1.1 $\mu\text{g}/\ell$ in the WCC samples. In 1981 and 1982, lindane was detected at 1.25 and 1.19 $\mu\text{g}/\ell$, respectively.

Dieldrin was not detected at 2 $\mu\text{g}/\ell$ in September; however, it was detected at 2.0 $\mu\text{g}/\ell$ in March 1992 and at 1.9 $\mu\text{g}/\ell$ (1.7 $\mu\text{g}/\ell$ in the U.S. EPA split) in June 1992. In the U.S. EPA sample, endrin ketone was detected at 1.6 $\mu\text{g}/\ell$, heptachlor epoxide was detected at 0.21 $\mu\text{g}/\ell$, and methoxychlor was detected at 0.19 $\mu\text{g}/\ell$. Where tested, these compounds were not detected in the WCC samples due to the higher detection limits.

Historically, 2,4,5-T was detected at 1.9 $\mu\text{g}/\ell$, and 2,4-D was detected at 47 $\mu\text{g}/\ell$ in 1981. Dieldrin was detected at 0.41 $\mu\text{g}/\ell$ in 1982, while heptachlor was detected at 1.76 $\mu\text{g}/\ell$, and diazinon was detected at 1.6 $\mu\text{g}/\ell$ in 1981. Lindane was detected at 1.25 $\mu\text{g}/\ell$ in 1981 and at 1.19 $\mu\text{g}/\ell$ in 1982.

Well OWC-6

Silvex was detected at 1.5 $\mu\text{g}/\ell$ in September 1992, an increase from the 0.75 $\mu\text{g}/\ell$ detected in June 1992. Lindane was detected at a concentration of 1.4 $\mu\text{g}/\ell$ in September and the BHC isomers were detected at a range of 1.7 to 6 $\mu\text{g}/\ell$. 4,4'-DDD was detected at 2.1 $\mu\text{g}/\ell$. These concentrations are all somewhat higher than the concentrations detected in June 1992. Aldrin and dieldrin were not detected in September, but were detected at 0.26 $\mu\text{g}/\ell$ and 1.1 $\mu\text{g}/\ell$, respectively, in June 1992. These concentrations are below the laboratory detection limits for the September samples. The VOC 1,1,1-trichloroethane (TCA) was detected at 7.2 $\mu\text{g}/\ell$, down from the 18 $\mu\text{g}/\ell$ detected in June 1992.

Arsenic was reported to have been detected at 0.014 $\mu\text{g}/\ell$ in September 1992. This concentration is vastly below the typical detection limits for arsenic (5 or 10 $\mu\text{g}/\ell$), suggesting that the concentration was not converted from the mg/ℓ , normally reported for arsenic, to the $\mu\text{g}/\ell$ indicated on the WCC table.

Historically, this well was sampled twice in 1981 and contained numerous contaminants. Lindane was detected at 5.78 and 43.2 $\mu\text{g}/\ell$; 4,4'-DDD was detected at 0.99 and 2.53 $\mu\text{g}/\ell$; aldrin was detected at 6.94 $\mu\text{g}/\ell$; dieldrin was detected at 3.89 and 1.46 $\mu\text{g}/\ell$; and total arsenic was detected at 56 and 59 $\mu\text{g}/\ell$. The data presented for this well in the Site Characterization Report (WCC, February 1988) are of poor copy quality; however, it appears that PCBs were reported as detected at a concentration of 1,600 $\mu\text{g}/\ell$ in February 1981. In August 1981, the individual Aroclors (PCB-1242, -1254, -1221, -1232, -1248, and -1260) were analyzed. All of these PCBs were reported as being non-detect (with a detection level of 10 $\mu\text{g}/\ell$). Other compounds reported in 1981 were 2,4-D, 4,4'-DDT, diazinon, heptachlor, malathion, ethyl and methyl parathion, and phosdrin (mevinphos).

Well OWC-8

Chevron added well OWC-8 to the monitoring network in 1992 to provide information for the shallow loess zone in the highly contaminated central site area.

In the September 1992 WCC sample, silvex was detected at a concentration of 59 $\mu\text{g}/\ell$; similar to the 54 $\mu\text{g}/\ell$ detected in their June 1992 sample and above the MCL of 50 for this herbicide. 2,4,5-T was not detected in the WCC samples in June or September, though it was detected at 0.89 $\mu\text{g}/\ell$ in the June 1992 U.S. EPA split sample.

Lindane was detected at 400 $\mu\text{g}/\ell$, significantly higher than the 80 $\mu\text{g}/\ell$ detected in their June sample or the 110 $\mu\text{g}/\ell$ detected in the June U.S. EPA split. Alpha-BHC and delta-BHC were detected at 160 $\mu\text{g}/\ell$, and 120 $\mu\text{g}/\ell$, respectively. These concentrations are also higher than in the June WCC or U.S. EPA samples. No other pesticides were detected in the September (or June) WCC samples due to the high detection limits; however, the June U.S. EPA split sample indicated the presence of dieldrin at 2.2 $\mu\text{g}/\ell$, endrin ketone at 0.25 $\mu\text{g}/\ell$, and heptachlor epoxide at 1.2 $\mu\text{g}/\ell$. The latter two compounds were not analyzed by WCC. The concentration of heptachlor epoxide is above the 0.2 $\mu\text{g}/\ell$ MCL for this compound.

In the WCC sample, the following VOC concentrations were detected: benzene, 410 $\mu\text{g}/\ell$; chlorobenzene, 500 $\mu\text{g}/\ell$; and ethylbenzene, 37 $\mu\text{g}/\ell$. Xylene, which was detected at 78 $\mu\text{g}/\ell$ in the June sample, was not detected at a limit of 34 $\mu\text{g}/\ell$ in September 1992. The benzene and chlorobenzene concentrations detected in September are approximately half the concentrations that were detected in June; the ethylbenzene concentration is similar to the 30 $\mu\text{g}/\ell$ detected in June. In June 1992, these compounds also had been detected in the U.S. EPA split sample though at much lower concentrations. Also detected in the U.S. EPA split sample were carbon disulfide (17 $\mu\text{g}/\ell$), 1,1-dichloroethane (1 $\mu\text{g}/\ell$), 1,2-dichloroethane (11 $\mu\text{g}/\ell$), TCE (2 $\mu\text{g}/\ell$), toluene (2 $\mu\text{g}/\ell$), and 4-methyl-2-pentanone (41 $\mu\text{g}/\ell$). Analysis of BNAs by the U.S. EPA indicated the presence of 1,4-dichlorobenzene (used in fumigants and insecticides) at 39 $\mu\text{g}/\ell$, and isophorone (used in pesticides) at 85 $\mu\text{g}/\ell$.

The total arsenic concentration, which was detected at 40 $\mu\text{g}/\ell$ in the WCC sample, and at 51 $\mu\text{g}/\ell$ in the U.S. EPA split in June, was reported to be only 0.086 $\mu\text{g}/\ell$ in September 1992. Dissolved arsenic, which was detected at 47 $\mu\text{g}/\ell$ in the June WCC sample, and at 61.5 $\mu\text{g}/\ell$ in the June U.S. EPA split, was reported to be only 0.11 in September. The vast discrepancy in these figures suggests that the concentrations may not have been converted from mg/ ℓ (ppm), the typical reporting unit for arsenic, to $\mu\text{g}/\ell$ (ppb) as reported on the WCC Table 1.

In 1981, 2,4,5-T was detected at 9.7 $\mu\text{g}/\ell$, silvex was detected at 0.22 $\mu\text{g}/\ell$, and lindane was detected at 32.6 and 184 $\mu\text{g}/\ell$. Dieldrin was detected at 1.45 $\mu\text{g}/\ell$, and total arsenic was detected at 5 and 12 $\mu\text{g}/\ell$. Aldrin, diazinon, ethyl and methyl parathion, and 2,4-D were also detected in 1981. No samples were collected for VOC analyses at that time.

Well OWC-9

This shallow well, located at the northeastern corner of the site, was added to the monitoring network in March 1992 at the suggestion of the U.S. EPA to eliminate a data gap for that portion of the site. Lindane has not been detected in 1992; however, beta-BHC was detected at 0.076 $\mu\text{g}/\ell$ in September and at 0.059 $\mu\text{g}/\ell$ during the March 1992 sampling event. Histori-

cally, lindane was detected at 0.45 $\mu\text{g}/\ell$ and 0.82 $\mu\text{g}/\ell$ in 1981.

In September 1992, dieldrin was detected at 0.14 $\mu\text{g}/\ell$, 4,4'-DDD was detected at 0.21 $\mu\text{g}/\ell$, 4,4'-DDT was detected at 0.15 $\mu\text{g}/\ell$, and 4,4'-DDE was not detected at 0.1 limits. These low concentrations are similar to the values previously detected in 1992. In 1981, dieldrin was detected at 0.41 and 0.55 $\mu\text{g}/\ell$, 4,4'-DDD was detected at 0.91 and 1.08 $\mu\text{g}/\ell$, 4,4'-DDE was detected at 0.19 and 0.22 $\mu\text{g}/\ell$, and 4,4'-DDT was detected at 0.53 and 0.84 $\mu\text{g}/\ell$.

Total arsenic was detected at 6.6 $\mu\text{g}/\ell$ in March 1992, and had been detected at 4.0 and 5.0 $\mu\text{g}/\ell$ in 1981. It was not detected in either June or September 1992; dissolved arsenic was not detected from any of the three sampling events.

Well OWC-12A

This deep well is located in the central portion of the site and has consistently been one of the most contaminated wells. The September 1992 concentrations are generally quite similar to the concentrations detected in the June 1992 WCC and U.S. EPA split samples. In June 1992, numerous additional compounds were either detected in the U.S. EPA split samples due to the lower detection levels used for those samples or they were simply not analyzed by Ortho-Chevron.

In September 1992, silvex was detected at 3.7 $\mu\text{g}/\ell$ concentration, similar to the 3.2 to 4.3 $\mu\text{g}/\ell$ range previously detected in 1992. Although not detected in September, 2,4-D had been detected previously at concentrations between 18 to 28 $\mu\text{g}/\ell$ in 1992 in the WCC and U.S. EPA samples.

Lindane was detected at a concentration of 310 $\mu\text{g}/\ell$, an increase from the 260 $\mu\text{g}/\ell$ detected in June in 1992, and vastly above the 0.2 $\mu\text{g}/\ell$ MCL. Alpha-BHC was detected at 230 $\mu\text{g}/\ell$; and delta-BHC was detected at 270 $\mu\text{g}/\ell$; beta-BHC was not detected at the detection limit of 150 $\mu\text{g}/\ell$. As with the lindane concentration, the BHC concentrations were higher than had been detected in June in the WCC sample, though they are quite similar to the concentrations detected in the U.S. EPA split sample for June. The concentrations detected in the duplicate sample were similar to those in the sample.

As with the June samples, the detection limits for the WCC data are either too high to indicate the presence of the remaining pesticides, or the samples were not analyzed. The June 1992 U.S. EPA split sample indicated the presence of 4,4'-DDD (14 $\mu\text{g}/\ell$), 4,4'-DDT (2.1 $\mu\text{g}/\ell$), aldrin (7.3 $\mu\text{g}/\ell$), dieldrin (4.3 $\mu\text{g}/\ell$), endrin (3.9 $\mu\text{g}/\ell$), endrin ketone (2.7 $\mu\text{g}/\ell$), and methoxychlor (10 $\mu\text{g}/\ell$). Values for the duplicate samples were similar to those given for the sample.

In June 1992, the VOCs 1,1,2-trichloroethane (1,1,2-TCA), benzene, chlorobenzene, ethylbenzene, and xylene were detected in the both the WCC and U.S. EPA samples. In September, all

except 1,1,2-TCA were detected at similar concentrations. The concentration of 1,1,2-TCA detected in June (72 $\mu\text{g}/\ell$) was below the 100 $\mu\text{g}/\ell$ detection limit for the September sampling event for the sample; however, 1,1,2-TCA was detected in duplicate sample at 61 $\mu\text{g}/\ell$. In September 1992, benzene was detected at 140 $\mu\text{g}/\ell$; chlorobenzene was detected at 930 $\mu\text{g}/\ell$; ethylbenzene was detected at 130 $\mu\text{g}/\ell$; and xylenes were detected at 790 $\mu\text{g}/\ell$. These concentrations are generally similar to the concentrations detected in the WCC and U.S. EPA samples for June 1992.

The June 1992 U.S. EPA split sample also indicated the presence of vinyl chloride (28 $\mu\text{g}/\ell$), 1,1-dichloroethene (7 $\mu\text{g}/\ell$), chloroform (24 $\mu\text{g}/\ell$), 1,2-dichloroethene (33 $\mu\text{g}/\ell$), TCE (6 $\mu\text{g}/\ell$), tetrachloroethene (10 $\mu\text{g}/\ell$), toluene (7 $\mu\text{g}/\ell$), and styrene (13 $\mu\text{g}/\ell$). These TCL compounds were reported as not being detected in the WCC June or September 1992 samples. Of the VOCs detected in OWC-12A, only toluene, ethylbenzene, and xylene do not exceed the respective MCLs. (No MCLs have been established for styrene or chloroform.)

The June 1992 U.S. EPA split sample was also analyzed for BNAs. 1,4-dichlorobenzene (67 $\mu\text{g}/\ell$), 1,2,4-trichlorobenzene (54 $\mu\text{g}/\ell$), naphthalene (230 $\mu\text{g}/\ell$), and 2-methylnaphthalene (65 $\mu\text{g}/\ell$) were detected. The duplicate sample indicated that 1,4-dichlorobenzene was present at 75 $\mu\text{g}/\ell$, which is the MCL for the compound.

No arsenic was detected in either the June or September 1992 samples.

Well OWC-13

WCC elected to analyze this well rather than nearby well, OWC-19, that has typically been monitored. Compared with the June 1992 results for well OWC-19, this well contains vastly less arsenic [13 $\mu\text{g}/\ell$ compared to 16,400 $\mu\text{g}/\ell$ (U.S. EPA split)] and lindane (39 $\mu\text{g}/\ell$ compared to 150 $\mu\text{g}/\ell$). It contains a similar amount of silvex (33 $\mu\text{g}/\ell$ compared to 28 $\mu\text{g}/\ell$), and over twice as much chlorobenzene (610 $\mu\text{g}/\ell$ compared to 250 $\mu\text{g}/\ell$).

Numerous other VOCs were detected in well OWC-19 in June 1992 at concentrations lower than the 25 $\mu\text{g}/\ell$ used during the analysis of the sample from OWC-13. Thus, it is possible that these VOCs may also be present at this well location.

Well OWC-13 had not been sampled since 1983. At that time, 2,4-D was detected at a maximum concentration of 105 $\mu\text{g}/\ell$, 2,4,5-T at a maximum of 173 $\mu\text{g}/\ell$, and silvex at a maximum of 1.9 $\mu\text{g}/\ell$. Of the pesticides, lindane was detected at a maximum of 393 $\mu\text{g}/\ell$, aldrin at a maximum of 63.6 $\mu\text{g}/\ell$, and dieldrin at a maximum of 2.37 $\mu\text{g}/\ell$. Xylenes were detected at a maximum of 108 $\mu\text{g}/\ell$, and total arsenic was detected at a maximum of 3.7 $\mu\text{g}/\ell$. Historically, lindane had a maximum of 2,300 $\mu\text{g}/\ell$ in 1981; numerous other pesticides were also detected at that time.

- Well OWC-14 The September 1992 data indicate that silvex, the BHC isomers, lindane, chlorobenzene, and arsenic were detected in this downgradient shallow well. Silvex was detected at 0.95 $\mu\text{g}/\ell$; the BHC isomers were detected between 0.65 and 2.1 $\mu\text{g}/\ell$; lindane was detected at 0.78 $\mu\text{g}/\ell$; chlorobenzene was detected at 8.3 $\mu\text{g}/\ell$; and arsenic was reported at a concentration of 0.0052 $\mu\text{g}/\ell$. This arsenic concentration is suspicious in comparison to those of previous years, and may be in mg/ℓ not the $\mu\text{g}/\ell$ reported. In June 1992, only beta-BHC was detected in this well. In 1991, however, silvex, the BHC isomers, lindane, dieldrin, total arsenic, and dissolved arsenic were detected. Chlorobenzene had not been detected in this well in 1991 or 1992, the only years for which these data are available. Lindane is the only contaminant concentration detected in excess of the MCL from this well, and is higher than has been detected since 1988 (although no MCLs have been established for the BHC isomers).
- Well OWC-15 The September 1992 results indicate that lindane was detected at 0.24 $\mu\text{g}/\ell$, which is slightly above the MCL. Alpha-BHC, beta-BHC, and dieldrin were detected at 0.17 $\mu\text{g}/\ell$, 0.12 $\mu\text{g}/\ell$, and 0.22 $\mu\text{g}/\ell$, respectively. These concentrations are similar to those detected in previous years. No herbicides, VOCs or arsenic were detected in June or September 1992.
- Well OWC-16 Silvex was detected at 2.1 $\mu\text{g}/\ell$ in September, slightly higher than the 1.9 $\mu\text{g}/\ell$ in June 1992. Lindane has not been detected since 1989, although the BHC isomers have consistently been detected. In September 1992, the BHC isomers were detected at concentrations between 1.5 and 4.0 $\mu\text{g}/\ell$ in this shallow well. No VOCs or arsenic were detected in September or June 1992.
- Well OWC-17 This shallow well is located in the central portion of the site, downgradient of the fire debris disposal area. Based on the historical data available, lindane concentrations have ranged up to 264 $\mu\text{g}/\ell$ (1983). The lindane concentration detected in September 1992 was 22 $\mu\text{g}/\ell$, similar to concentrations detected since 1990, and well above the 0.2 $\mu\text{g}/\ell$ MCL. The BHC isomers ranged from 15 to 83 $\mu\text{g}/\ell$, and are also similar to concentrations previously detected.
- Silvex was detected in September 1992 at 15 $\mu\text{g}/\ell$; similar to the concentrations detected since 1990. Historically, a maximum concentration of 83 $\mu\text{g}/\ell$ of silvex was detected in 1981.
- The volatile organics analyses indicate the presence of 690 $\mu\text{g}/\ell$ of chlorobenzene in September 1992 compared to the 580 $\mu\text{g}/\ell$ detected in June 1992, the 1991 maximum of 540 $\mu\text{g}/\ell$, and the 420 $\mu\text{g}/\ell$ detected in 1990. Xylenes have not been detected in this well since 1988 (5.8 $\mu\text{g}/\ell$); historically they have been detected at concentrations up to 1,060 $\mu\text{g}/\ell$ (1983).
- Total arsenic has not been detected in 1992, although it was detected at a range of 21 to 68 $\mu\text{g}/\ell$ in 1991. Dissolved

arsenic was reported at 0.11 $\mu\text{g}/\ell$ in September 1992, and was not detected in June. In 1991, dissolved arsenic was detected at a range of 19 to 62 $\mu\text{g}/\ell$. Again, in comparison to previous years, the low concentration reported for September 1992 is suspicious, and may be in mg/ℓ and not the $\mu\text{g}/\ell$ reported.

Well OWC-18

This downgradient well is screened in the deep, unweathered limestone bedrock. Lindane was detected in September 1992 at 2.4 $\mu\text{g}/\ell$, which is an increase from the 2.0 $\mu\text{g}/\ell$ detected in June, and is the highest lindane concentration detected since 1989 when 2.9 $\mu\text{g}/\ell$ was detected. Prior to 1989, lindane had been detected at concentrations up to 155 $\mu\text{g}/\ell$ (1987).

Alpha-BHC was detected at 8 $\mu\text{g}/\ell$, and delta-BHC was detected at 3.2 $\mu\text{g}/\ell$ in September 1992. These concentrations are similar to those previously detected since 1990. Beta-BHC was not detected in the June or September WCC samples, but was in the June 1992 U.S. EPA split sample.

Silvex was detected 0.99 $\mu\text{g}/\ell$, and 2,4-D was detected at 4.8 $\mu\text{g}/\ell$ in September 1992. These concentrations are also similar to the concentrations detected in June 1992.

The September 1992 concentrations for 1,2-DCA, 1,1,2-TCA, and chlorobenzene are similar to the concentrations in June 1992, and in previous years. Chlorobenzene was detected at 140 $\mu\text{g}/\ell$; 1,2-DCA was detected at 15 $\mu\text{g}/\ell$; and 1,1,2-TCA was detected at 18 $\mu\text{g}/\ell$. Historically, the June 1991 WCC sample results indicate the presence of 1,2-dichloroethene (1,2-DCE) at a concentration of 15 $\mu\text{g}/\ell$. As mentioned in the original review of these data, this is quite similar to the concentrations typically detected for 1,2-DCA, and suggests that the identification of this compound as 1,2-DCE could simply be a typographical error. At the lower detection rates obtained for the June 1992 U.S. EPA split sample, vinyl chloride was detected at an estimated (coded "J") 11 $\mu\text{g}/\ell$; TCE was detected at 3 $\mu\text{g}/\ell$; benzene was detected at 4 $\mu\text{g}/\ell$; and xylene was detected at 2 $\mu\text{g}/\ell$, whereas these compounds were undetected by WCC.

Total arsenic was not detected in September 1992, although it was detected at 9.8 $\mu\text{g}/\ell$ in June 1992; dissolved arsenic was not detected in June or September 1992.

Well OWC-19

Well OWC-19 was not sampled in September 1992; nearby shallow well OWC-13 was sampled instead.

Previously, lindane was detected in the 1991 and 1992 at a range of 98 to 150 $\mu\text{g}/\ell$, comparable to the 1989 to 1990 range of 100 to 140 $\mu\text{g}/\ell$ (WCC and U.S. EPA samples). Alpha-BHC ranged from 60 to 88 $\mu\text{g}/\ell$ in 1991 and 1992, while beta-BHC ranged from 10 to 14 $\mu\text{g}/\ell$. Delta-BHC was only detected in the U.S. EPA split samples at 3.5 and 3.0 in 1991 and 1992, respectively.

Silvex was detected at a range of 21 to 28 $\mu\text{g}/\ell$ in 1991 and 1992. Dieldrin was detected at 1.6 $\mu\text{g}/\ell$ in the June 1991 EPA split, but was not detected at limits of 0.89 $\mu\text{g}/\ell$ in the June 1992 split sample. Endosulfan I and heptachlor (not tested by WCC) were detected in the June 1991 split sample at 0.62 $\mu\text{g}/\ell$ and 0.48 $\mu\text{g}/\ell$, respectively, but were not detected in the June 1992 split sample at limits of 0.09 $\mu\text{g}/\ell$.

In 1991 and 1992, chlorobenzene was detected at a range of 120 to 270 $\mu\text{g}/\ell$; 1,1,2-TCA (when detected) was found at a range of 9.9 to an estimated 13 $\mu\text{g}/\ell$ (U.S. EPA split); and TCE (when detected) ranged from 6.1 to 10 $\mu\text{g}/\ell$. In the 1991 and 1992 U.S. EPA split samples, 1,2-DCE was detected at 10 and 8 $\mu\text{g}/\ell$, respectively. At the lower detection rates for the U.S. EPA split sample for June 1992, vinyl chloride (estimated 4 $\mu\text{g}/\ell$); 1,1-dichloroethane (1 $\mu\text{g}/\ell$); chloroform (1 $\mu\text{g}/\ell$); and benzene (6 $\mu\text{g}/\ell$) were detected. The June 1992 U.S. EPA split sample was also analyzed for semi-volatiles, and 1,4-dichlorobenzene was detected at 22 $\mu\text{g}/\ell$.

In 1991 and 1992, total arsenic was detected at a range of 10,300 to 21,000 $\mu\text{g}/\ell$ (U.S. EPA split), and dissolved arsenic was detected at 8,500 to 15,500 $\mu\text{g}/\ell$. These concentrations are similar to those previously detected for this well and greatly exceed the MCL of 50 $\mu\text{g}/\ell$ for total arsenic.

Well OWC-20

Lindane was detected in September 1992 at 0.72 $\mu\text{g}/\ell$ in this deep well located down and cross-gradient from the central site area of highest contamination. This concentration is similar to those previously detected. Alpha-BHC was detected at 0.23 $\mu\text{g}/\ell$; delta-BHC was not detected in 1992, but was detected at a maximum of 0.29 $\mu\text{g}/\ell$ in 1991.

Trichloroethene was detected at 1,500 $\mu\text{g}/\ell$ in September, down from the 4,200 $\mu\text{g}/\ell$ detected in June 1992. In 1991, TCE was detected at a range of 1,500 to 2,100 $\mu\text{g}/\ell$. These TCE concentrations vastly exceed the 5 $\mu\text{g}/\ell$ MCL. No other VOCs were detected in the WCC samples in June or September 1992.

The U.S. EPA VOC split collected in June 1992 was analyzed at lower detection limits than either the June or September WCC samples. In the U.S. EPA split sample, 1,1-dichloroethene (3 $\mu\text{g}/\ell$); 1,2-DCE (1 $\mu\text{g}/\ell$); chloroform (1 $\mu\text{g}/\ell$); 1,1,2-TCA (3 $\mu\text{g}/\ell$); tetrachloroethene (1 $\mu\text{g}/\ell$); benzene (1 $\mu\text{g}/\ell$); and chlorobenzene (2 $\mu\text{g}/\ell$) were also detected. The TCE concentration for the U.S. EPA split sample is estimated at 600 $\mu\text{g}/\ell$, much lower than the 4,200 $\mu\text{g}/\ell$ from the WCC sample result. It is likely that the TCE concentration of the EPA sample exceeded the calibration range of the gas chromatograph set for analysis at low detection rates. Volatile organics, other than xylene, were not analyzed prior to 1991.

Total and dissolved arsenic were not detected in either June or September 1992.

Well OWC-23 This well was added to the monitoring well network in 1992, as it is screened in the clay underlying the contaminated silty loess and could provide information on migration through the clay layer. In September 1992, lindane was detected at 0.36 $\mu\text{g}/\ell$; alpha-BHC was detected at 0.33 $\mu\text{g}/\ell$; beta-BHC was detected at 2.0 $\mu\text{g}/\ell$, and delta-BHC was detected at 0.48 $\mu\text{g}/\ell$. Silvex was detected 2.1 $\mu\text{g}/\ell$, and dieldrin was detected at 2.6 $\mu\text{g}/\ell$. These concentrations are all quite similar to those concentrations detected in June. 4,4-DDD (1.1 $\mu\text{g}/\ell$), 4,4-DDE (1.1 $\mu\text{g}/\ell$), 4,4-DDT (1.5 $\mu\text{g}/\ell$), aldrin (1.3 $\mu\text{g}/\ell$), and endrin (0.73 $\mu\text{g}/\ell$) were also detected in September, and are approximately double the concentrations (or detection limit) reported in June 1992.

Total arsenic was detected at 28 $\mu\text{g}/\ell$ in September, down from the 50 $\mu\text{g}/\ell$ detected in June 1992; dissolved arsenic was not detected. No VOCs were detected.

Well OWC-24 Alpha-BHC was detected at 0.08 $\mu\text{g}/\ell$ in September 1992, somewhat higher than the 1990 to June 1992 range of 0.056 to 0.064 $\mu\text{g}/\ell$. Beta-BHC was detected at 0.073, similar to the maximum of 0.068 $\mu\text{g}/\ell$ detected in 1991. No other pesticides were detected in this shallow downgradient well located off site, although dieldrin was detected at 0.63 $\mu\text{g}/\ell$ from one sample in 1988. No other contaminants were detected other than the common laboratory contaminant acetone (23 $\mu\text{g}/\ell$).

Well OWC-25 No contaminants were detected in this deep well located off site and far downgradient in 1990, 1991, or 1992. Historically, 0.53 $\mu\text{g}/\ell$ of lindane was detected in this well in 1987, and 0.15 $\mu\text{g}/\ell$ was detected in 1989. In 1989, 9 $\mu\text{g}/\ell$ of total arsenic was detected.

Well OWC-26 No contaminants were detected in this shallow downgradient well located off site in 1990, 1991, or 1992. In 1989, total arsenic was detected at 10 $\mu\text{g}/\ell$, and dissolved arsenic was detected at 16 $\mu\text{g}/\ell$ in a duplicate sample. The original sample analyses did not detect arsenic.

Well OWC-27 No pesticides or herbicides were detected in September 1992 in this offsite, deep downgradient well. Previously in 1992, lindane had been detected at 0.066 $\mu\text{g}/\ell$ (one sample indicated non-detect at 0.050 $\mu\text{g}/\ell$). In 1991, lindane was detected at a range of 0.12 to 0.23 $\mu\text{g}/\ell$. In 1991, alpha-BHC was detected at a maximum of 0.12 $\mu\text{g}/\ell$, and delta-BHC was detected at a maximum of 0.064 $\mu\text{g}/\ell$.

The volatile organic compound TCE was detected at 11 $\mu\text{g}/\ell$ in September 1992, compared to 19 $\mu\text{g}/\ell$ in June 1992, and 10 $\mu\text{g}/\ell$ in June 1991. These TCE concentrations are above the 5 $\mu\text{g}/\ell$ MCL. 1,2-DCE was detected in one sample from 1991 at 9.8 $\mu\text{g}/\ell$, but was not detected at limits of 5 $\mu\text{g}/\ell$ in 1992. Volatile organic compounds other than xylene were not analyzed prior to 1991; xylene was not detected in 1991 and 1992.

Total arsenic was detected at 18 $\mu\text{g}/\ell$, an increase from the previous 1992 maximum of 7.7 $\mu\text{g}/\ell$; dissolved arsenic was not detected.

Well OWC-28

This deep downgradient well is located off site and is screened in the limestone bedrock. In September 1992, lindane was detected at 3.4 $\mu\text{g}/\ell$ in the sample and 3.5 $\mu\text{g}/\ell$ in the duplicate. This is similar to the concentrations detected since this well was installed in 1989. Alpha-BHC was detected at 1.8 $\mu\text{g}/\ell$, and delta-BHC was detected at 0.37 $\mu\text{g}/\ell$ in September 1992. No other pesticides were detected in the 1992 WCC samples; however, 4,4'-DDD (0.032 $\mu\text{g}/\ell$); 4,4'-DDT (0.04 $\mu\text{g}/\ell$), and dieldrin (0.05 $\mu\text{g}/\ell$) were detected at the lower detection rates for the June 1992 U.S. EPA split sample.

In September 1992, carbon disulfide was detected at 6.8; this was the only VOC detected in the WCC samples for 1992. At the lower detection limits for the U.S. EPA split sample from June, chloroform (1 $\mu\text{g}/\ell$), toluene (2 $\mu\text{g}/\ell$) chlorobenzene (3 $\mu\text{g}/\ell$), and xylene (4 $\mu\text{g}/\ell$) were detected. VOCs, other than xylene, were not analyzed prior to 1991. In the 1991 WCC samples, xylene was detected at a range of 5 to 9 $\mu\text{g}/\ell$ (both values from the duplicate samples). No BNAs were detected in the sample collected by the U.S. EPA in June 1992.

Total and dissolved arsenic were not detected in 1991 or 1992.

Well OWC-29

This downgradient offsite well, screened in the deep limestone, was drilled and sampled in August 1992, at which time a U.S. EPA split sample was collected. WCC also collected samples in September 1992.

Lindane was detected at 0.56 $\mu\text{g}/\ell$ in the August WCC sample, compared to the 0.73 $\mu\text{g}/\ell$ detected in the U.S. EPA split sample. The September WCC sample contained 0.7 $\mu\text{g}/\ell$ of lindane. All three of these concentrations are above the 0.2 $\mu\text{g}/\ell$ MCL. Alpha-BHC was detected at 0.25 $\mu\text{g}/\ell$ and 0.26 $\mu\text{g}/\ell$ in the two sampling events, and are comparable to the 0.23 $\mu\text{g}/\ell$ from the August U.S. EPA sample. No other pesticides were detected.

TCE was detected at 6.0 and 6.4 $\mu\text{g}/\ell$ in the two sampling events, comparable to the U.S. EPA split data. The TCE concentration exceeds the 5 $\mu\text{g}/\ell$ MCL. In the WCC samples, 1,2-DCE was detected at 31 and 34 $\mu\text{g}/\ell$. 1,2-DCE was not detected in the August 1992 U.S. EPA split sample; however, tetrachloroethene was detected at 3 $\mu\text{g}/\ell$, and 1,1-dichloroethane was detected at 1 $\mu\text{g}/\ell$. No BNAs were detected in the sample collected for the U.S. EPA. Arsenic was not detected in either the WCC or U.S. EPA samples.

3.0 REVIEW OF WCC SEPTEMBER 1992 QUARTERLY GROUNDWATER MONITORING REPORT

The revised format for the WCC data tables makes the data comparison to the report text much easier, and less mistakes were apparent in this report than in

the 1992 Annual Report. The following are specific comments related to the review of the WCC September 1992 Quarterly Groundwater Monitoring Report.

- o Bullet 4 in Section 2.2.2 states that "Target Compound List (TCL) volatile organics" were analyzed, and the results are presented in Tables 1 and 2; however, not all TCL VOCs are listed in these tables. In previous reports (e.g., the 1991-1992 Annual Report), WCC had included the TCL for VOCs and footnoted on the tables that "[a]ll samples analyzed for Target Compound List (TCL) volatile organics by Method 8240. Only detected volatile organics and xylene are listed".

In this report, several compounds (e.g., 1,2-DCA) are shown as undetected for all wells listed on Table 1; however, these compounds were detected in at least one of the wells on Table 2. To a reader unfamiliar with past reports, it would appear that only those TCL compounds listed on the two tables were analyzed. It was assumed during this review that the samples were analyzed for the entire TCL list, and that only selected data were included on the table. WCC should provide the list of TCL VOCs in their report and provide the detection limits for all compounds analyzed but not detected. Preferably, as has been mentioned in previous reviews, WCC should provide the actual laboratory data so that the data can be reviewed for Quality Assurance/Quality Control (QA/QC).

- o In the second paragraph of Section 5.0 (page 5-1), there is a typographical error. The reference to well OWC-11 (which no longer exists) should be changed to well OWC-13.
- o In the same paragraph, the three wells with lindane concentrations in excess of 25 $\mu\text{g}/\ell$ are listed. As has been mentioned in previous report reviews, a more meaningful concentration to use would be the 0.2 $\mu\text{g}/\ell$ MCL for lindane. Wells with concentrations above the MCL are onsite shallow wells OWC-3, OWC-6, OWC-8, OWC-13, OWC-14, OWC-15, OWC-17, and OWC-23; onsite deep wells OWC-12A, OWC-18, and OWC-20; and offsite deep wells OWC-28 and OWC-29.
- o The same paragraph also gives the range of lindane concentrations in the downgradient wells as 0.36 to 22 $\mu\text{g}/\ell$. The correct minimum is 0.24 $\mu\text{g}/\ell$ from well OWC-15.
- o As mentioned in the individual well data discussions, the total arsenic concentrations reported on Table 1 for wells OWC-6, OWC-8, and OWC-14, and the dissolved arsenic concentration reported for wells OWC-8 and OWC-17 appear to be in the mg/ℓ typically reported by the laboratory rather than the $\mu\text{g}/\ell$ indicated on the table. These data should be verified, and a correction issued if necessary.

4.0 CONCLUSIONS

The pesticide, herbicide, and arsenic concentrations detected in the groundwater samples from the wells sampled during this period are generally similar to those detected in previous years. The volatile organics concentrations in various wells, particularly those concentrations in excess of the MCLs for the VOCs, should be addressed by Chevron. Of particular concern is the concentration of

TCE in well OWC-20 (1,500 $\mu\text{g}/\ell$). The source and extent of the volatiles contamination (particularly the TCE) should be determined in future work at this site. It should be noted that TCE (also chlorobenzene) is more dense than water, and has a tendency to sink to the bottom of the water column. Therefore, it is possible that the TCE contamination exists in the groundwater below the intervals presently being monitored.

APPENDIX A

Historical Groundwater Data from the Ortho-Chevron Facility

Explanations for Historical Groundwater Tables.

Minimum/Maximum concentrations are shown when more than one sampling event per year. For compounds not detected, only the minimum detection limits are given.

Individual sampling events (e.g., Jun-92) represent U.S. EPA split samples.

MCL = Maximum Contaminant Level; [Proposed MCL].

* MCL of 170 ug/L for total 1,2-Dichloroethene (70 ug/L for Cis- and 100 ug/L for Trans-).

Shading indicates that at least one concentration detected during the year shown meets or exceeds the present MCL for that compound.

Blank spaces indicate no information as to whether a sample was not collected, not analyzed, or no data has been located by TES X.

{Duplicate Sample Result} Not shown where compounds were nondetect at the same detection limits.

I = Data invalidated by laboratory.

J = Concentration estimated by laboratory.

NA = Not Analyzed for compound (e.g., Endrin).

NS = Not Sampled for analysis (e.g., Herbicides).

U = Undetected at detection limit provided.

WCC data tables, beginning with selected wells in December 1990, report that all TCL volatile compounds are analyzed, but omitted from their data tables if the results were nondetect. Thus, TCL volatile compounds for WCC are frequently shown as "U" with no detection limit indicated as none was provided by WCC. Other parameters may be shown as "U" when all parameters were nondetect at various detection limits (e.g., Semi-volatiles).

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-1 (Page 1)

Analyte (ug/L)	MCL	WCC 1981	WCC 1982	WCC 1983	WCC 1984	WCC 1985	WCC 1986	WCC 1987
Herbicides								
2,4,5-T		.1U/0.4	5U	1U	1U	1U		1U
2,4-D	70	1U/1.8	5U	.1U	1U	1U		1U
2,4,5-TP (Silvex)	50	0.4	1U	.1U	NA	NA		
Pesticides								
alpha-BHC								
beta-BHC								
delta-BHC								
gamma-BHC (Lindane)	0.2	0.15/0.26	.1U/1.4	.1U	.1U	.1U	.1U	.1U/1.4
4,4'-DDD		.2U	NA	1U	.1U	.1U		.1U
4,4'-DDE		.2U	NA	1U	.1U	.1U		.1U
4,4'-DDT		.3U	NA	1U	.1U	.1U		.1U
Aldrin		0.12/.2U	.1U	.1U	.1U	.1U		.1U/.40
Dieldrin		.2U	.1U	.1U	.1U	.1U		.1U
Diazinon		.5U	NA	NA	NA	NA		
Endrin	0.2	.4U	NA	.1U	.1U	.1U		
Chlordane	2	1U	NA	5U	5U	.1U		
Heptachlor	0.4	.1U	NA	.1U	.1U	.1U		
Methoxychlor	40	.8U	NA	5U	5U	5U		
Toxaphene	3	10U	NA	5U	5U	5U		
Malathion		1U	NA	NA	NA	NA		
E. Parathion		.5U	NA	NA	NA	NA		
M. Parathion		1U	NA	NA	NA	NA		
Volatile Organics								
Acetone								
Carbon Disulfide								
1,2-Dichloroethene	170*							
1,1,1-Trichloroethane	200							
1,1,2-Trichloroethane	[5]							
1,2-Dichloroethane	5							
2-Butanone (MEK)								
Trichloroethene	5							
Benzene	5							
Chlorobenzene	100							
Ethylbenzene	700							
Xylene (Xylol)	10000	NA	10U	1U	1U/2.1	1U		1U
Metals								
Total Arsenic	50	1U/10	0.4/1.1	0.5/0.85	.2U/2.4	1U		
Dissolved Arsenic		NA	NA	NA	NA	NA		10U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-1 (Page 2)

Analyte (ug/L)	MCL	WCC 1988	WCC 1989	WCC 1990	WCC 1991	WCC 1992
Herbicides						
2,4,5-T		1U		.2U	.2U	.2U
2,4-D	70	1U		1.2U	1.2U	1.2U
2,4,5-TP (Silvex)	50			.17U	.17U	.17U
Pesticides						
alpha-BHC				.05U	.05U	.05U
beta-BHC				.05U	.05U	.05U
delta-BHC				.05U	.05U	.05U
gamma-BHC (Lindane)	0.2	.1U/.16	0.053	.05U	.05U	.05U
4,4'-DDD		.1U		.1U	.1U	.1U
4,4'-DDE		.1U		.1U	.1U	.1U
4,4'-DDT		.1U		.1U	.1U	.1U
Aldrin		.1U		.5U	.05U	.05U
Dieldrin		.1U		.1U	.1U	.1U
Diazinon						
Endrin	0.2					NA
Chlordane	2					NA
Heptachlor	0.4					NA
Methoxychlor	40	.5U				NA
Toxaphene	3	5U				NA
Malathion						
E. Parathion						
M. Parathion						
Volatile Organics						
Acetone					10U	10U
Carbon Disulfide					U	5U
1,2-Dichloroethene	170*				U	5U
1,1,1-Trichloroethane	200				U	5U
1,1,2-Trichloroethane	[5]				5U	5U
1,2-Dichloroethane	5				U	5U
2-Butanone (MEK)					U	5U
Trichloroethene	5				5U	5U
Benzene	5				U	5U
Chlorobenzene	100				5U	5U
Ethylbenzene	700				U	5U
Xylene (Xylol)	10000	1U/5U		5U	5U	5U
Metals						
Total Arsenic	50			5U	5U	5U
Dissolved Arsenic		10U		5U	5U	5U

Historical Groundwater Data from the Ortho-Chevron Facility

Well: OWC-2

Analyte (ug/L)	MCL	WCC 1981	WCC 1982	WCC 1983	WCC No Data 1984-1989	WCC 1990	WCC 1991	WCC 1992
Herbicides								
2,4,5-T		NA	5U	.1U/2.49		.2U	.32U	.2U
2,4-D	70	1U	5U	.1U/6.6		1.2U	1.9U	1.2U
2,4,5-TP (Silvex)	50	.1U	1U	NA		.17U	.27U	.17U
Pesticides								
alpha-BHC						.05U	0.059	.05U
beta-BHC						.05U	.05U	.05U
delta-BHC						.05U	.05U	.05U
gamma-BHC (Lindane)	0.2	0.23	0.82/4.6	.1U/6.41		.05U	.05U	.05U
4,4'-DDD		.2U	NA	NA		.1U	.1U	.1U
4,4'-DDE		.2U	NA	NA		.1U	.1U	.1U
4,4'-DDT		.3U	NA	NA		.1U	.1U	.1U
Aldrin		.2U	.1U	.1U/0.32		.05U	.05U	.05U
Dieldrin		.2U	0.24/0.40	.1U		.1U	.1U	.1U
Diazinon		.5U	NA	NA				
Endrin	2	.4U	NA	NA		.1U	NA	NA
Chlordane	2	1U	NA	NA		.05U	NA	NA
Heptachlor	0.4	.2U	NA	NA		.05U	NA	NA
Methoxychlor	40	.8U	NA	NA		.5U	NA	NA
Toxaphene	3	10U	NA	NA		5U	NA	NA
Malathion		1U	NA	NA				
Ethyl Parathion		.5U	NA	NA				
Methyl Parathion		1U	NA	NA				
Volatile Organics								
Vinyl Chloride	2					U	10U	U
Acetone						U	10U	U
Carbon Disulfide						15	U	5U
1,1-Dichloroethene	7					U	U	U
1,2-Dichloroethene	170*					U	5U	5U
Chloroform						U	U	U
1,2-Dichloroethane	5					5U	5U	5U
Trichloroethene	5					U	5U	5U
1,1,2-Trichloroethane	[5]					5U	5U	5U
Benzene	5					5U	U	5U
Tetrachloroethene	5					U	U	U
Toluene	1000					U	U	U
Chlorobenzene	100					5U	5U	5U
Ethylbenzene	700					5U	U	5U
Xylene (Xylol)	10000	NA	500U	1U		5U	5U	5U
Metals								
Total Arsenic	50	1	.1U/0.4	0.63/1.2		320	59	13/27
Dissolved Arsenic		NA	NA	NA		5U	NA	5U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-3

Analyte (ug/L)	MCL	WCC 1981	WCC No data for 1982-1991				WCC 1992
Herbicides							
2,4,5-T		0.1/NA					.2U
2,4-D	70	1U					1.2U
2,4,5-TP (Silvex)	50	NA/.1U					.17U
Pesticides							
alpha-BHC							0.24/0.68
beta-BHC							.05U
delta-BHC							.05U
gamma-BHC (Lindane)	0.2	0.3/1.07					0.66/3.0
4,4'-DDD		.2U					.1U
4,4'-DDE		.2U					.1U
4,4'-DDT		.3U					.1U
Aldrin		.12U/.2U					.05U
Dieldrin		.2U					.1U
Diazinon		.5U/1.7					
Endrin	2	.4U					.1U
Chlordane	2	1U					.5U
Heptachlor	0.4	.1U/.2U					.05U
Methoxychlor	40	.8U					.5U
Toxaphene	3	10U					5U
Malathion		1U/2U					
E. Parathion		.5U					
M. Parathion		1U/2U					
Volatile Organics							
Acetone							10U
Carbon Disulfide							5U
1,2-Dichloroethene	170*						5U
1,1,1-Trichloroethane	200						5U
1,1,2-Trichloroethane	[5]						5U
1,2-Dichloroethane	5						5U
2-Butanone (MEK)							11
Trichloroethene	5						5U
Benzene	5						5U
Chlorobenzene	100						5U
Ethylbenzene	700						5U
Xylene (Xylol)	10000						5U
Metals							
Total Arsenic	50	1U/24					5U
Dissolved Arsenic							5U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-4

Analyte (ug/L)	MCL	WCC 1981	WCC 1982	WCC No data for 1983-1991			WCC 1992	EPA Jun-92
Herbicides								
2,4,5-T		.1U/1.9	NA				.2U	.2U
2,4-D	70	1U/47	5U				1.2U/1.2	1.3
2,4,5-TP (Silvex)	50	.1U	1U				.17U	.15U
Pesticides								
alpha-BHC							.25U/1.1	.14U
beta-BHC							3.3/8.1	7.2
delta-BHC							1.0/1.1	0.87
gamma-BHC (Lindane)	0.2	1U/1.25	1.19				0.3/1U	.52U
4,4'-DDD		.2U	NA				.5U	.06U
4,4'-DDE		.2U	NA				.5U	.11U
4,4'-DDT		.3U	NA				.5U	.01U
Aldrin		.12U	.1U				.25U	.004U
Dieldrin		.2U	0.41				1.9/2	1.7
Diazinon		.5U/1.6	NA					
Endrin	2	.4U	NA				.5U	.15U
Endrin Ketone								1.6
Chlordane	2	1U	NA				2.5U	.02U
Heptachlor	0.4	2U/1.76	NA				.25U	.009U
Heptachlor Epoxide								0.21
Methoxychlor	40	.8U	NA				2.5U	0.19
Toxaphene	3	10U	NA				25U	.5U
Malathion		1U	NA					
E. Parathion		.5U	NA					
M. Parathion		1U	NA					
PCBs		10U**	NA					U***
Volatile Organics								
Acetone							10U	2U
Carbon Disulfide							5U	1U
1,2-Dichloroethene	170*						5U	1U
1,1,1-Trichloroethane	200						5U	1U
1,1,2-Trichloroethane	[5]						5U	1U
1,2-Dichloroethane	5						5U	1U
2-Butanone (MEK)							10U	2U
Trichloroethene	5						75/110	120
Benzene	5						5U	1U
Chlorobenzene	100						5U	1U
Ethylbenzene	700						5U	1U
Xylene	10000	NA	10U				5U	1U
Metals								
Total Arsenic	50	1U	NA				5U	50U
Dissolved Arsenic							10U	50U

Note:

** Individual Aroclors (PCB-1242, -1254, -1221, -1232, -1248, -1260) were analyzed.

*** PCB detection limits varied from 0.05 to 0.40 ug/L.

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-6

Analyte (ug/L)	MCL	WCC Feb. 1981	WCC Aug. 1981	WCC No data for 1982-1991			WCC 1992
Herbicides							
2,4,5-T		.1U	NA				.2U
2,4-D	70	1.1	1U				1.2U
2,4,5-TP (Silvex)	50	NA	.1U				0.75/1.5
Pesticides							
alpha-BHC							1.2/1.8
beta-BHC							2.7/6
delta-BHC							1.1/1.7
gamma-BHC (Lindane)	0.2	43.2	5.7B				1/1.4
4,4'-DDD		2.53	0.99				2/2.1
4,4'-DDE		.2U	.2U				.5U
4,4'-DDT		0.96	.3U				.5U
Aldrin		6.94	.2U				0.26/1U
Dieldrin		3.89	1.46				1.1/2U
Diazinon		27.3	5.8				
Endrin	2	.4U	.4U				.5U
Chlordane	2	1U	1U				2.5U
Heptachlor	0.4	4.52	.2U				.25U
Methoxychlor	40	.8U	.8U				2.5U
Toxaphene	3	10U	10U				25U
Malathion		2U	4.1				
Parathion, Ethyl		0.8	.5U				
Parathion, Methyl		2.2	1U				
PCB	0.5	1600	10U**				
Phosdrin (Mevinphos)		2.3	1U				
Volatile Organics							
Acetone							10U
Carbon Disulfide							5U
1,2-Dichloroethene	170*						5U
1,1,1-Trichloroethane	200						7.2/18
1,1,2-Trichloroethane	[5]						5U
1,2-Dichloroethane	5						5U
2-Butanone (MEK)							10U
Trichloroethene	5						5U
Benzene	5						5U/13
Chlorobenzene	100						5U
Ethylbenzene	700						5U
Xylene (Xylol)	10000	NA	NA				5U
Metals							
Total Arsenic	50	56	59				0.014/25U
Dissolved Arsenic							10U

Note:

** Individual Aroclors (PCB-1242, -1254, -1221, -1232, -1248, -1260) were analyzed.

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-7

Analyte (ug/L)	MCL	WCC Feb. 1981	WCC Aug. 1981	WCC July 1982	WCC Oct. 1982	WCC 1983	WCC No Data after 1983
Herbicides							
2,4,5-T		0.2	3.9	NA	5U	.1U/48.4	
2,4-D	70	2.6	7.4	180	5U	1.3/106	
2,4,5-TP (Silvex)	50	NA	3.9	94	NA	NA	
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC (Lindane)	0.2	1880	410	87.9	373	36.9/407	
4,4'-DDD		.2U	12.3	NA	NA	NA	
4,4'-DDE		.2U	.2U	NA	NA	NA	
4,4'-DDT		0.3	8.8	NA	NA	NA	
Aldrin		63.3	26	8.05	.1U	2.78/62.7	
Dieldrin		.2U	6.25	0.1	7.6	.1U/7.05	
Diazinon		427	.5U	NA	NA	NA	
Endrin	2	.4U	.4U	NA	NA	NA	
Chlordane	2	1U	1U	NA	NA	NA	
Heptachlor	0.4	.1U	.2U	NA	NA	NA	
Methoxychlor	40	.8U	.8U	NA	NA	NA	
Toxaphene	3	10U	10U	NA	NA	NA	
Malathion		100	1U	NA	NA	NA	
Parathion, Ethyl		12.9	0.5U	NA	NA	NA	
Parathion, Methyl		6.1	1U	NA	NA	NA	
PCB	0.5	10U	10U**	NA	NA	NA	
Phosdrin (Mevinphos)		7.9	1U	NA	NA	NA	
Volatile Organics							
Acetone							
Chlorobenzene	100						
1,2-Dichloroethene	170*						
1,1,2-Trichloroethane	[5]						
Trichloroethene	5						
Xylene (Xylol)	10000	NA	NA	121	500U	320/390	
Metals							
Total Arsenic	50	130	880	360	260	82/130	
Dissolved Arsenic		NA	NA	NA	NA	NA	

Note:

** Individual Aroclors (PCB-1242, -1254, -1221, -1232, -1248, -1260) were analyzed.

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-8

Analyte (ug/L)	MCL	WCC Feb. 1981	WCC Aug. 1981	WCC No data for 1982-1991			WCC 1992	EPA Jun-92
Herbicides								
2,4,5-T		9.7	NA				20U	0.89
2,4-D	70	87.8	1U				120U	.5U
2,4,5-TP (Silvex)	50	NA	0.22				54/59	34
Pesticides								
alpha-BHC							55/160	75
beta-BHC							5U	5.6
delta-BHC							43/120	50
gamma-BHC (Lindane)	0.2	184	32.6				80/400	110
4,4'-DDD		.2U	.2U				40U	.038U
4,4'-DDE		.2U	.2U				40U	.03U
4,4'-DDT		.3U	.3U				40U	.17U
Aldrin		4.59	.2U				20U	.95U
Dieldrin		1.45	.2U				40U	2.2
Diazinon		37.8	0.78				NA	
Endrin	2	.4U	.4U				40U	.1U
Endrin Ketone								0.25
Chlordane	2	1U	1U				200U	.1U
Heptachlor	0.4	.1U	.2U				20U	.045U
Heptachlor Epoxide	0.2							1.2
Methoxychlor	40	.8U	.8U				200U	.05U
Toxaphene	3	10U	10U				2000U	2.5U
Malathion		2U	1U					
Parathion, Ethyl		2.5	0.5U					
Parathion, Methyl		1.6	1U					
PCBS	0.5	10U	10U**					U***
Volatile Organics								
Acetone		NA	NA				67U	7U
Carbon Disulfide							34U	17
1,1-Dichloroethane							U	1
1,2-Dichloroethene	170*						34U	1U
1,2-Dichloroethane	5						34U	11
1,1,1-Trichloroethane	200						25U	1U
1,1,2-Trichloroethane	[5]						25U	1U
2-Butanone (MEK)							67U	
Trichloroethene	5						25U	2
Benzene	5						410/820	250
Toluene	1000						U	2
Chlorobenzene	100						500/960	290
Ethylbenzene	700						30/37	12
4-Methyl-2-Pentanone							U	41
Xylenes (Xylol)	10000						34U/78	17
Semivolatiles								
1,4-Dichlorobenzene	75						NS	39
Isophorone							NS	85
Metals								
Total Arsenic	50	5	12				0.086/40	51
Dissolved Arsenic							0.11/47	61.5

Notes:

** Individual Aroclors (PCB-1242, -1254, -1221, -1232, -1248, -1260) were analyzed.

*** Aroclor detection limits varied from 0.25 to 2.0 ug/L.

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-9

Analyte (ug/L)	MCL	WCC 1981	WCC No data for 1982-1991				WCC 1992
Herbicides							
2,4,5-T		.1U					.2U
2,4-D	70	1U					1.2U
2,4,5-TP (Silvex)	50	.1U					.17U
Pesticides							
alpha-BHC							.05U
beta-BHC							.05U/0.076
delta-BHC							.05U
gamma-BHC (Lindane)	0.2	0.45/0.82					.05U
4,4'-DDD		0.91/1.08					0.16/0.76
4,4'-DDE		0.19/0.22					0.1U/0.4
4,4'-DDT		0.53/0.84					0.15/0.73
Aldrin		.2U/.26					.05U
Dieldrin		0.41/0.55					0.1U/0.16
Diazinon		0.5U					
Endrin	2	.4U					.1U
Chlordane	2	1U					.5U
Heptachlor	0.4	.1U					.05U
Methoxychlor	40	.8U					.5U
Toxaphene	3	10U					5U
Malathion		1U					
E. Parathion		.5U					
M. Parathion		1U					
Volatile Organics							
Acetone							10U
Carbon Disulfide							5U
1,2-Dichloroethene	170*						5U
1,1,1-Trichloroethane	200						5U
1,1,2-Trichloroethane	[5]						5U
1,2-Dichloroethane	5						5U
2-Butanone							10U
Trichloroethene	5						5U
Benzene	5						5U
Chlorobenzene	100						5U
Ethylbenzene	700						5U
Xylene	10000						5U
Metals							
Total Arsenic	50	4/5					6.6/10U
Dissolved Arsenic							5U

Well: OWC-12

[illegible]

Historical Groundwater Data from the Ortho-Chevron Facility

Well: OWC-12A (Page 2)

Analyte (ug/L)	MCL	WCC 1989	WCC 1990	EPA Jun-90	WCC 1991	EPA Jun-91	WCC 1992	EPA Jun-92
Herbicides								
2,4,5-T			2U	1U	.4U	3.9U	.8U	.2U
2,4-D	70		12U	I	2.4U	15U	4.8U/23,{4.8U/18}	18,{28}
2,4,5-TP (Silvex)	50		1.7U/19	I	1.8/3,{2/2.1}	3.4	3.2/3.7,{3.4/3.6}	3.8,{4.3}
Pesticides								
alpha-BHC			160	200	180/210,{170/220}	190	180/230,{170/210}	210 {220}
beta-BHC			21	18	33/100U {31}	24	27/50U,{25/50U}	35 {37}
delta-BHC			160	170	240/250,{230/250}	210	230/270,{210/240}	260 {270}
gamma-BHC (Lindane)	0.2	420/430	260/350	340	240/350,{230/360}	270	260/310,{240/280}	330 {340}
4,4'-DDD		3	20U	2.6	40U	3	40U,{33U}	14 {11}
4,4'-DDE		1.2	20U	0.82	40U	1.7U	40U,{33U}	1.2U
4,4'-DDT		1.7/12	20U	1.6	40U	3.3	40U,{33U}	2.1 {2.1}
Aldrin		3.5/6.2	10U	.5U	20U	3.5	20U,{17U}	7.3 {8}
Dieldrin		3.6	20U	1.7	40U	3.9	40U,{33U}	4.3 {4.2}
Endrin	2		20U	0.91	NA	2.3	NA, {100U}	3.9 {3.8}
Endosulfan I				.05U		1.7		.18U
Endrin Ketone				1.1		NA		2.7 {3.1}
Chlordane	2		10U	.5U	NA	NA	NA, {500U}	.4U
Heptachlor	0.4		10U		NA	.83U	NA, {50U}	1.1U
Methoxychlor	40		100U	2.2	NA	NA	NA, {500U}	10 {11}
Toxaphene	3		1000U		NA	17U	NA, {5000U}	10U
Volatile Organics								
Vinyl Chloride	2		U	14J	U	50U	U	28 {29}
Acetone			U	10U	200U/500,{720}	50U	U	10U {9U}
Carbon Disulfide			25U		U	25U	100U, {50U}	1U
1,1-Dichloroethene	7		U	7J	U	25U	U	7 {6}
1,2-Dichloroethene	170*		U		100U	25U	50U	1U
Chloroform			U	26J	U	25U	U	24 {20}
1,2-Dichloroethane	5		31	39J	100U	25U	50U	33 {32}
Trichloroethene	5		U	5J	100U	25U	50U	6 {5}
1,1,2-Trichloroethane	[5]		84	99J	100U	77	72/100U,{61/71}	86J {82J}
Benzene	5		100	120J	U	95	120/140,{120/160}	140 {140}
Tetrachloroethene	5		U	7J	U	25U	U	10 {10}
Toluene	1000		U	5J	U	25U	U	7 {7}
Chlorobenzene	100		650	810J	610/850,{600/850}	660	840/930,{890/920}	1100 {940}
Ethylbenzene	700		130	100J	U	110	120/130,{120/130}	120 {120}
Styrene						25U	U	13 {12}
Xylene	10000		620/720	960J	720,{400/700}	430	700/790,{730/790}	477 {498}
Semivolatiles								
1,4-Dichlorobenzene	75	NS	NS	NS	NS	NS	NS	67 {75}
1,2,4-Trichlorobenzene		NS	NS	NS	NS	NS	NS	54 {48}
Naphthalene		NS	NS	NS	NS	NS	NS	230 {200}
2-Methylnaphthalene		NS	NS	NS	NS	NS	NS	65 {69}
Metals								
Total Arsenic	50		5U	10U	5U/7.8,{5U}	10U	5U	50U
Dissolved Arsenic			5U	10U	5U	10U	5U	50U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-13

Analyte (ug/L)	MCL	WCC 1981	WCC 1982	WCC 1983	WCC No Data for 1984 -1991			WCC 1992
Herbicides								
2,4,5-T		0.8/2.1	5U	.1U/172				10U
2,4-D	70	1.3/3.7	5U	1U/105				60U
2,4,5-TP (Silvex)	50	2.1	1U	1.91				33
Pesticides								
alpha-BHC								62
beta-BHC								10U
delta-BHC								100
gamma-BHC (Lindane)	0.2	234/2300	54.7/305	20.9/393				39
4,4'-DDD		0.3/1.4	NA	NA				20U
4,4'-DDE		.2U/0.35	NA	NA				20U
4,4'-DDT		.3U	NA	NA				20U
Aldrin		.2U/16.3	.1U	.1U/63.6				10U
Dieldrin		.2U/1.06	.1U/2.7	.1U/2.37				20U
Diazinon		.5U	NA	25U				
Endrin	2	0.2/0.4	NA	NA				NA
Chlordane	2	1U	NA	NA				NA
Heptachlor	0.4	1U/2.43	NA	NA				NA
Methoxychlor	40	.8U	NA	NA				NA
Toxaphene	3	10U	NA	NA				NA
Malathion		1U/2U	NA	NA				
Ethyl Parathion		.5U	NA	NA				
Methyl Parathion		.5U	NA	NA				
Phosdrin (Mevinphos)		2U/3.1	NA	NA				
Volatile Organics								
Acetone								50U
Carbon Disulfide								25U
1,2-Dichloroethene	170*							25U
1,2-Dichloroethane	5							25U
2-Butanone								50U
Trichloroethene	5							25U
1,1,1-Trichloroethane	200							25U
1,1,2-Trichloroethane	[5]							25U
Benzene	5							25U
Chlorobenzene	100							610
Ethylbenzene	700							25U
Xylene (Xylol)	10000	NA	10U	23/108				25U
Metals								
Total Arsenic	50	1U/2	1.3/1.4	1.5/3.7				13
Dissolved Arsenic								10U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-14 (Page 1)

Analyte (ug/L)	MCL	WCC 1981	WCC 1982	WCC 1983	WCC 1984	WCC 1985	WCC 1986	WCC 1987
Herbicides								
2,4,5-T		.1U	NS	1U	1U/42	1U	1U	1U
2,4-D	70	1U	NS	1.27/5U	1U/50.9	1U	1U	1U
2,4,5-TP (Silvex)	50	.1U	NS	1U	1U	NA	NA	
Pesticides								
alpha-BHC								
beta-BHC								
delta-BHC								
gamma-BHC (Lindane)	0.2	0.93/3.56	NS	1.2/3.9	1.07/2.2	0.73/1.28	0.62	44/1.6
4,4'-DDD		.2U/0.5	NS	1U	.1U/0.74	.1U	.1U	.1U/.83
4,4'-DDE		.2U/0.2	NS	1U	.1U/0.21	.1U	.1U	.1U
4,4'-DDT		.3U	NS	1U	.1U/0.34	.1U	.1U	.1U
Aldrin		.2U/0.88	NS	.1U/0.25	.1U/0.53	.1U/0.12	.1U	.1U/.21
Dieldrin		.2U/0.65	NS	1U/1.2	0.4/0.97	0.32/0.56	.1U	.1U/.59
Diazinon		.5U	NS	25U				
Endrin	2	.4U	NS	.1U	.1U	.1U	.1U	
Chlordane	2	1U	NS	5U	5U	.1U/5U	.1U	
Heptachlor	0.4	.1U	NS	.1U	.1U	.1U	.1U	
Methoxychlor	40	.8U	NS		5U	5U	5U	
Toxaphene	3	10U	NS	5U	5U	5U	5U	
Volatile Organics								
Acetone								
Carbon Disulfide								
1,2-Dichloroethene	170*							
1,1,1-Trichloroethane	200							
1,1,2-Trichloroethane	[5]							
1,2-Dichloroethane	5							
2-Butanone (MEK)								
Trichloroethene	5							
Benzene	5							
Chlorobenzene	100							
Ethylbenzene	700							
Xylene (Xylol)	10000	NA		1U	1U	1U/3.4	1U	1U
Metals								
Total Arsenic	50	1U/8	NS	2.7/3.5	1.3/8.5	2/4	2	
Dissolved Arsenic								10U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-14 (Page 2)

Analyte (ug/L)	MCL	WCC 1988	WCC 1989	WCC 1990	WCC 1991	WCC 1992	WCC 1993
Herbicides							
2,4,5-T		1U		.4U	.2U	.2U	
2,4-D	70	1U		.6U	1.2U	1.2U	
2,4,5-TP (Silvex)	50			1.7/2.6	0.58/0.62	.17U/0.95	
Pesticides							
alpha-BHC				0.7	0.75/0.99	.2U/2.1	
beta-BHC				0.6	0.77/1.2	0.59/1.3	
delta-BHC				0.39	0.3/0.41	.2U/0.65	
gamma-BHC (Lindane)	0.2	74/2.71	0.55	25/26	0.27/.034	.2U/0.78	
4,4'-DDD		.1U/.105		.1U	.2U	.4U	
4,4'-DDE		.1U		.1U	.2U	.4U	
4,4'-DDT		.1U	0.26	.1U	.2U	.4U	
Aldrin		.1U/4.27	D (<2.5)	.05U	.1U	.2U	
Dieldrin		.1/5.7	D (.14-.26)	.47/.5	0.39/0.54	.4U	
Diazinon							
Endrin	2					NA	
Chlordane	2					NA	
Heptachlor	0.4					NA	
Methoxychlor	40	.5U				NA	
Toxaphene	3	5U				NA	
Volatile Organics							
Acetone					10U	10U	
Carbon Disulfide					U	5U	
1,2-Dichloroethene	170*				U	5U	
1,1,1-Trichloroethane	200				U	5U	
1,1,2-Trichloroethane	[5]				5U	5U	
1,2-Dichloroethane	5				U	5U	
2-Butanone (MEK)					U	10U	
Trichloroethene	5				5U	5U	
Benzene	5				U	5U	
Chlorobenzene	100				5U	5U/8.3	
Ethylbenzene	700				U	5U	
Xylene (Xylol)	10000	1U		5U	5U	5U	
Metals							
Total Arsenic	50		5	7.8/25U	10U/11	0.0052/10U	
Dissolved Arsenic		10U		10U/13	5U/6.6	10U	

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-15 (Page 1)

Analyte (ug/L)	MCL	WCC 1981	WCC 1983	WCC 1985	WCC 1986	WCC 1987
Herbicides						
2,4,5-T		.1U	1U			1U
2,4-D	70	1U	1U			1U
2,4,5-TP (Silvex)	50	.1U	1U			
Pesticides						
alpha-BHC						
beta-BHC						
delta-BHC						
gamma-BHC (Lindane)	0.2	0.23/0.38	0.43			19/.35
4,4'-DDD		.2U	NA			.1U
4,4'-DDE		.2U	NA			.1U
4,4'-DDT		.2U	NA			.1U
Aldrin		.12U	.1U			.1U
Dieldrin		.2U/0.21	0.34			.1U/.25
Diazinon		.5U	25U			
Endrin	2	.2U	NA			
Chlordane	2	1U	NA			
Heptachlor	0.4	.1U	NA			
Methoxychlor	40	.8U	NA			
Toxaphene	3	10U	NA			
Malathion		1U	NA			
Ethyl Parathion		.5U	NA			
Methyl Parathion		1U	NA			
Volatile Organics						
Acetone						
Carbon Disulfide						
1,2-Dichloroethene	170*					
1,1,1-Trichloroethane	200					
1,1,2-Trichloroethane	[5]					
1,2-Dichloroethane	5					
2-Butanone (MEK)						
Trichloroethene	5					
Benzene	5					
Chlorobenzene	100					
Ethylbenzene	700					
Xylene (Xylol)	10000	NA	1U			1U
Metals						
Total Arsenic	50	1U/1	2			
Dissolved Arsenic						10U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-15 (Page 2)

Analyte (ug/L)	MCL	WCC 1988	WCC 1989	WCC 1990	WCC 1991	WCC 1992	WCC 1993
Herbicides							
2,4,5-T		1U		.2U	.2U	.2U	
2,4-D	70	1U		1.2U	1.2U	1.2U	
2,4,5-TP (Silvex)	50			.17U	.17U	.17U	
Pesticides							
alpha-BHC				0.15	0.14/0.15	0.055/0.17	
beta-BHC				.05U	.05U	.05U	
delta-BHC				0.12	.05U/0.13	.05U/0.12	
gamma-BHC (Lindane)	0.2	14/.35	0.25	.13/.19	0.13/0.16	.05U/0.24	
4,4'-DDD		.1U		.1U	.1U	.1U	
4,4'-DDE		.1U		.1U	.1U	.1U	
4,4'-DDT		.1U		.1U	.1U	.1U	
Aldrin		.1U		.05U	.05U	.05U	
Dieldrin		.1U/.20	D(.14-.26)	.17/.20	0.31/0.33	0.22	
Diazinon							
Endrin	2					NA	
Chlordane	2					NA	
Heptachlor	0.4					NA	
Methoxychlor	40	.5U				NA	
Toxaphene	3	5U				NA	
Malathion							
Ethyl Parathion							
Methyl Parathion							
Volatile Organics							
Acetone					10U	10U	
Carbon Disulfide					U	5U	
1,2-Dichloroethene	170*				U	5U	
1,1,1-Trichloroethane	200				U	5U	
1,1,2-Trichloroethane	[5]				5U	5U	
1,2-Dichloroethane	5				U	5U	
2-Butanone (MEK)					U	10U	
Trichloroethene	5				5U	5U	
Benzene	5				U	5U	
Chlorobenzene	100				5U	5U	
Ethylbenzene	700				U	5U	
Xylene (Xylol)	10000	1U		5U	5U	5U	
Metals							
Total Arsenic	50			5U	5U	5U	
Dissolved Arsenic		10U		5U	5U	10U	

Note:

D = Detected within range indicated according to WCC report text.

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-16 (Page 1)

Analyte (ug/L)	MCL	WCC 1981	WCC 1982	WCC 1983	WCC 1984	WCC 1985	WCC 1986	WCC 1987
Herbicides								
2,4,5-T		NA	NA	1U	1U	1U	1U	1U
2,4-D	70	3.8	NA	1U	1U	1U	1U	1U
2,4,5-TP (Silvex)	50	3.3	NA	7.5	NA	NA	NA	
Pesticides								
alpha-BHC								
beta-BHC								
delta-BHC								
gamma-BHC (Lindane)	0.2	0.91	NA	0.31/0.50	0.66/0.90	0.65/1.15	0.53	.1U/.60
4,4'-DDD		.2U	NA	1U	.1U	.1U	.1U	.1U
4,4'-DDE		.2U	NA	1U	.1U/0.55	.1U/0.14	.1U	.1U
4,4'-DDT		.3U	NA	1U	.1U	.1U	1.2	.1U
Aldrin		.2U	NA	.1U	.1U/4.45	.1U	.1U	.1U/4.69
Dieldrin		0.27	NA	0.35/1U	.1U/0.44	.1U	1.25	.1U
Diazinon		0.63	NA	25U	NA	NA	NA	
Endrin	2	.2U	NA	.1U	.1U	.1U	.1U	
Chlordane	2	1U	NA	5U	5U	.1U/5U	.1U	
Heptachlor	0.4	2	NA	1.59	.1U/1.43	.1U/1.75	.1U	
Methoxychlor	40	.8U	NA	5U	5U	5U	5U	
Toxaphene	3	10U	NA	5U	5U	5U	5U	
Malathion		1U	NA	NA	NA			
Ethyl Parathion		.6U	NA	NA	NA			
Methyl Parathion		1U	NA	NA	NA			
Volatile Organics								
Acetone								
Carbon Disulfide								
1,2-Dichloroethene	170*							
1,1,1-Trichloroethane	200							
1,1,2-Trichloroethane	[5]							
1,2-Dichloroethane	5							
2-Butanone (MEK)								
Trichloroethene	5							
Benzene	5							
Chlorobenzene	100							
Ethylbenzene	700							
Xylene (Xylol)	10000	NA	NA	1U	.1U/1.6	1U	1U	1U
Metals								
Total Arsenic	50	14	NA	3.1/5.9	1.2/1.4	1U	1U	
Dissolved Arsenic								10U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-16 (Page 2)

Analyte (ug/L)	MCL	WCC 1988	WCC 1989	WCC 1990	WCC 1991	WCC 1992	WCC 1993
Herbicides							
2,4,5-T		1U		.2U	.8U	.4U	
2,4-D	70	1U		1.2U	4.8U	2.4U	
2,4,5-TP (Silvex)	50			.17U/2.5	2.9/3.1	1.9/2.1	
Pesticides							
alpha-BHC				5.8	0.9/4.5	3.5/4	
beta-BHC				1.3	0.41/1.6	1.5/2	
delta-BHC				1.6	0.28/1.4	1.3/1.5	
gamma-BHC (Lindane)	0.2	1U/1.58	0.11	.5U	.05U	.25U	
4,4'-DDD		.1U/.132	0.39	1U	.1U	.5U	
4,4'-DDE		.1U		1U	.1U	.5U	
4,4'-DDT		.1U		1U	.1U	.5U	
Aldrin		.1U/3.4	D (<2.5)	.5U	.05U	.25U	
Dieldrin		.1U	0.14	1U	.1U	.5U	
Diazinon							
Endrin	2					NA	
Chlordane	2	1U/0.167				NA	
Heptachlor	0.4					NA	
Methoxychlor	40					NA	
Toxaphene	3					NA	
Malathion							
Ethyl Parathion							
Methyl Parathion							
Volatile Organics							
Acetone					10U	10U	
Carbon Disulfide					U	5U	
1,2-Dichloroethene	170*				U	5U	
1,1,1-Trichloroethane	200				U	5U	
1,1,2-Trichloroethane	[5]				5U	5U	
1,2-Dichloroethane	5				U	5U	
2-Butanone (MEK)					U	10U	
Trichloroethene	5				5U	5U	
Benzene	5				U	5U	
Chlorobenzene	100				5U	5U	
Ethylbenzene	700				U	5U	
Xylene (Xylol)	10000	1U		5U	5U	5U	
Metals							
Total Arsenic	50		5	5U	10U	10U	
Dissolved Arsenic		10U/50		5U	5U	10U	

Note:

D = Detected at <2.5 ug/L according to text of WCC report.

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-17 (Page 1)

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Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-17 (Page 2)

Analyte (ug/L)	MCL	WCC 1988	WCC 1989	WCC 1990	WCC 1991	WCC 1992
Herbicides						
2,4,5-T		1U		4U	4U	4U
2,4-D	70	1U/14		24U	12U	24U
2,4,5-TP (Silvex)	50		40	17U/17	8.5/12	15/18
Pesticides						
alpha-BHC				40	30/61	44/51
beta-BHC				6.6	2.5U/15	14/15
delta-BHC				50	16/93	83/88
gamma-BHC (Lindane)	0.2	69.1/84	47/59	25/40	18/33	22/26
4,4'-DDD		.1U		10U	5U	10U
4,4'-DDE		.1U	1	10U	5U	10U
4,4'-DDT		.1U/3.7		10U	5U	10U
Aldrin		.1U/12	2.5	5U	2.5U	5U
Dieldrin		.1U	1	10U	5U	10U
Diazinon						
Endrin	2					NA
Chlordane	2					NA
Heptachlor	0.4					NA
Methoxychlor	40	12U				NA
Toxaphene	3	5U				NA
Malathion						
Ethyl Parathion						
Methyl Parathion						
Volatile Organics						
Acetone				U	100/200U	50U
Carbon Disulfide				U	U	25U
1,2-Dichloroethene	170*			U	U	25U
1,2-Dichloroethane	5			25U	U	25U
2-Butanone				U	U	50U
Trichloroethene	5			U	100U	25U
1,1,1-Trichloroethane	200			U	U	25U
1,1,2-Trichloroethane	[5]			25U	100U	25U
Benzene	5			25U	U	25U
Chlorobenzene	100			420	310/540	580/690
Ethylbenzene	700			25U	U	25U
Xylene (Xylol)	10000	1U/5.8		5U/25U	12U/100U	25U
Metals						
Total Arsenic	50		9/17	18/25U	21/68	10U/11U
Dissolved Arsenic		10U	7/11	10U/15	19/62	0.11/11U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-18 (Page 1)

Analyte (ug/L)	MCL	WCC 1981	WCC 1982	WCC 1983	WCC 1984	WCC 1985	WCC 1986	WCC 1987
Herbicides								
2,4,5-T		2.4	5U	.1U	1U	1U	1U	1U
2,4-D	70	1.1	5U	.1U	1U/3.1	1U	1U	1U/2.1
2,4,5-TP (Silvex)	50	2.4	1U	NA	NA	NA	NA	
Pesticides								
alpha-BHC								
beta-BHC								
delta-BHC								
gamma-BHC (Lindane)	0.2	58	1.37/8.1	1U/6.34	2.29/6.93	2.46/3.48	2.63	2.44/155
4,4'-DDD		0.77	NA	1.7	.1U/2.08	0.16/0.5	0.48	.1U
4,4'-DDE		.2U	NA	1U	.1U/0.95	.1U/0.17	0.16	.1U/.28
4,4'-DDT		0.45	NA	1U	.1U/3	.1U	.1U	.1U/.36
Aldrin		0.77	2.5/2.7	.1U/1.78	0.4/1.35	.1U	0.59	.1U/12.6
Dieldrin		1.2	.1U/0.93	.1U/2.68	0.23/1.39	0.19/0.29	.22U	.19/.31
Diazinon		0.84	NA	NA	NA	NA	NA	
Endrin	2	.4U	NA	.1U	.1U	.1U	.1U	
Chlordane	2	1U	NA	5U	5U	.1U/5U	.1U	
Heptachlor	0.4	.2U	NA	.1U	.1U	.1U	.1U	
Methoxychlor	40	.8U	NA	5U	5U	5U	5U	
Toxaphene	3	10U	NA	5U	5U	5U	5U	
Malathion		1U	NA	NA	NA	NA	NA	
Ethyl Parathion		.5U	NA	NA	NA	NA	NA	
Methyl Parathion		1U	NA	NA	NA	NA	NA	
Volatile Organics								
Vinyl Chloride	2							
Acetone								
Carbon Disulfide								
1,1-Dichloroethene	7							
1,2-Dichloroethene	170*							
Chloroform								
1,2-Dichloroethane	5							
Trichloroethene	5							
1,1,2-Trichloroethane	[5]							
Benzene	5							
Tetrachloroethene	5							
Toluene	1000							
Chlorobenzene	100							1U/67.4
Ethylbenzene	700							
Xylene (Xylol)	10000	NA	10U	1U/9	1U/42.2	1U/15.6	1U	
Metals								
Total Arsenic	50	30	4.1/8.4	17/46	3.7/17	1U/9	5	
Dissolved Arsenic								10U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-18 (Page 2)

Analyte (ug/L)	MCL	WCC 1988	WCC 1989	WCC 1990	EPA Jun-90	WCC 1991	EPA Jun-91	WCC 1992	EPA Jun-92
Herbicides									
2,4,5-T		1U		.2U	.2U	.2U	3.9U	.2U	.2U
2,4-D	70	1U		1.2U	1U	1.2U	15U	3.1/4.8	4.6
2,4,5-TP (Silvex)	50			.34/.38	1	0.56/0.71	1.3J	0.76/0.99	1.1
Pesticides									
alpha-BHC				5.6	6.8	7.3/8.2	8.2	7.1/8	7
beta-BHC				.5U	0.2	.5U/0.88	.5U	.5U	0.28
delta-BHC				1.8	2.9	2.9/3	3.1	2.4/3.2	2
gamma-BHC (Lindane)	0.2	1.2/3.51	2.9	.87/1.6	1.8	1.2/1.7	1.4	2/2.4	1.9
4,4'-DDD		.1U/1.32	.27/.45	1U	.1U	1U	1U	1U	.06U
4,4'-DDE		.1U	U/.27	1U	.1U	1U	1U	1U	0.13
4,4'-DDT		.1U	.13/.32	1U	.1U	1U	1U	1U	0.19
Aldrin		.1U	.1/.2	.5U	.5U	.5U	.5U	.5U	0.16
Dieldrin		.1U/1.75	.33/.42	1U	.1U	1U	1U	1U	0.21
Endrin	2	.1U			.1U	NA	1U	NA	.02U
Endosulfan I					.05U		.5U		.009U
Endrin Ketone					.1U				.005U
Chlordane	2	.1U/.405			.5U	NA	NA	NA	.02U
Heptachlor	0.4	.1U				NA	.5U	NA	.009U
Methoxychlor	40	.5U			.5U	NA		NA	.01U
Toxaphene	3	5U				NA	10U	NA	.05U
Volatile Organics									
Vinyl Chloride	2				10U	U	10U	U	11J
Acetone					10U	10U	10U	U	5U
Carbon Disulfide				5U		U	5U	5U	1U
1,1-Dichloroethene	7				5U	U	5U	U	1U
1,2-Dichloroethene	170*					5U/15	5U	5U	1U
Chloroform					5U	U	5U	U	1U
1,2-Dichloroethane	5			15	19	U/11	13	12/15	16
Trichloroethene	5				5U	5U	5U	5U	3
1,1,2-Trichloroethane	[5]			17	21	12/20	16	16/18	20J
Benzene	5			5U	5U	U	5U	5U	4
Tetrachloroethene	5				5U	U	5U	U	1U
Toluene	1000				5U	U	5U	U	1U
Chlorobenzene	100			110	100J	100/150	120	120/140	140
Ethylbenzene	700			5U	5U	U	5U	5U	1U
Xylene	10000	1U		5U	5U	5U	5U	5U	2
Semivolatiles									
None Detected		NS	NS	NS	NS	NS	NS	NS	U
Metals									
Total Arsenic	50		23/28	5U	10U	7.4/10	10U	9.8/10U	50U
Dissolved Arsenic		10U	5U/90	5U	10U	5U	10U	10U	50U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-19 (Page 1)

Analyte (ug/L)	MCL	WCC 1983	WCC 1986	WCC 1987	WCC 1988	WCC 1989	WCC 1990	EPA Jun-90
Herbicides								
2,4,5-T		5.3/7.3	4.2	1U/3.6	1U		.8U	.2U
2,4-D	70	5U	1U	1U	1U/5.9		4.9/120U	1U
2,4,5-TP (Silvex)	50					30	1.7/35	43J
Pesticides								
alpha-BHC							99	68
beta-BHC							19	7.2
delta-BHC							10U	3
gamma-BHC (Lindane)	0.2	47.2/72.2	34.8	105/212	137/180	110/130	130/140	100
4,4'-DDD		1U/2.02	0.19	.1U/.16	.1U		20U	.1U
4,4'-DDE		1U/3.96	.1U	.1U	.1U/.269		20U	.1U
4,4'-DDT		1U/5.74	0.26	.1U	.1U/.863		20U	.1U
Aldrin		.1U/2.94	3.31	3.69/15.2	6.15/20		10U	.5U
Dieldrin		7.6/9.61	0.63	.23/.58	.1U/.875		20U	0.39
Endrin	2	.1U/1.7	.1U					.1U
Endosulfan I								0.1
Endrin Ketone								0.38
Chlordane	2	5U	.1U		.1U/.450			.5U
Heptachlor	0.4	1U/4.9	.1U		.1U/.101			
Methoxychlor	40	5U	5U		5U			.5U
Toxaphene	3	5U	5U		5U			
Volatile Organics								
Vinyl Chloride	2						U	10U
Acetone							U	10U
Carbon Disulfide							8.5U	U
1,1-Dichloroethene	7						U	5U
1,1-Dichloroethane							U	U
1,2-Dichloroethene	170*						U	U
Chloroform							U	5U
1,2-Dichloroethane	5						8.5U	9
Trichloroethene	5						U	11
1,1,1-Trichloroethane	200						U	U
1,1,2-Trichloroethane	[5]						10	12
Benzene	5						8.5U	5U
Tetrachloroethene	5						U	5U
Toluene	1000						U	5U
Chlorobenzene	100						160	7J
Ethylbenzene	700						8.5U	5U
Xylene (Xylol)	10000	1U/30	1U	1U	1U/5U		5U	5U
Semivolatiles								
1,4-Dichlorobenzene	75	NS	NS	NS	NS	NS	NS	NS
Metals								
Total Arsenic	50	55800/66700	40			13000/18000	15100/19500	1800J
Dissolved Arsenic				8000/22000	2800/19000	14000/17000	14800/22100	10U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-19 (Page 2)

Analyte (ug/L)	MCL	WCC 1991	EPA Jun-91	WCC 1992	EPA Jun-92	WCC 1993	EPA Jun-93
Herbicides							
2,4,5-T		4U	3.9U	8U	.2U		
2,4-D	70	24U	15U	48U	1.5U		
2,4,5-TP (Silvex)	50	21/24	22J	28	28		
Pesticides							
alpha-BHC		60/77	84	88	65		
beta-BHC		12 / 14	13	10U	10		
delta-BHC		10U	3.5	10U	3		
gamma-BHC (Lindane)	0.2	98/120	110	150	120		
4,4'-DDD		20U	.5U	20U	.6U		
4,4'-DDE		20U	.5U	20U	.41U		
4,4'-DDT		20U	.5U	20U	.26U		
Aldrin		10U	25U	10U	.35U		
Dieldrin		20U	1.6	20U	.89U		
Endrin	2		.5U	NA	.2U		
Endosulfan I			0.62		.09U		
Endrin Ketone					.05U		
Chlordane	2		NA	NA	.2U		
Heptachlor	0.4		0.48	NA	.09U		
Methoxychlor	40			NA	.1U		
Toxaphene	3		5U	NA	5U		
Volatile Organics							
Vinyl Chloride	2	U	17U	U	4J		
Acetone		10U/62	17U	U	6U		
Carbon Disulfide		U	8.3U	U	1U		
1,1-Dichloroethene	7	U	8.3U	U	1U		
1,1-Dichloroethane				U	1		
1,2-Dichloroethene	170*	U	8.3U	U	1U		
Chloroform		U	8.3U	U	1		
1,2-Dichloroethane	5	U	10	U	8		
Trichloroethene	5	U/6.1	8.3U	8.9	10		
1,1,1-Trichloroethane	200			8.5U	8.5U		
1,1,2-Trichloroethane	[5]	U/9.9	8.3U	11	13J		
Benzene	5	U	8.3U	8.5U	6		
Tetrachloroethene	5	U	8.3U	U	1U		
Toluene	1000	U	8.3U	U	1U		
Chlorobenzene	100	120/270	190	250	260		
Ethylbenzene	700	U	8.3U	8.5U	1U		
Xylene (Xylol)	10000	5U	8.3U	8.5U	1U		
Semivolatiles							
1,4-Dichlorobenzene	75	NS	NS	NS	22		
Metals							
Total Arsenic	50	10300/16400	21000	15000U	16400		
Dissolved Arsenic		8500/15100	14000	30000U	15500		

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-20 (Page 1)

Analyte (ug/L)	MCL	WCC 1983	WCC 1984	WCC 1985	WCC 1986	WCC 1987	WCC 1988
Herbicides							
2,4,5-T		5U	1U	1U	1U	1U	1U
2,4-D	70	5U/5.7	1U	1U	1U	1U	1U
2,4,5-TP (Silvex)	50						
Pesticides							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC (Lindane)	0.2	.1U	.1U/0.38	.28U/0.45	0.38	.55/1.83	1/.60
4,4'-DDD		1U	.1U/0.15	.1U	.1U	.1U	.1U
4,4'-DDE		1U	.1U/0.13	.1U	.1U	.1U	.1U
4,4'-DDT		1U	.1U/0.16	.1U	.1U	.1U	.1U
Aldrin		.1U	.1U	.1U	.1U	.39/.50	.24/.56
Dieldrin		1U	.1U/0.17	.1U	.1U	.1U	.1U/.33
Endrin	2	.1U/358	.1U	.1U	.1U		
Chlordane	2	5U	5U	.1U	.1U		
Heptachlor	0.4	.1U/0.6	.1U	.1U	.1U		
Methoxychlor	40	5U	5U	5U	5U		
Toxaphene	3	5U	5U	5U	5U		
Volatile Organics							
Acetone							
Carbon Disulfide							
1,1-Dichloroethene	7						
1,2-Dichloroethene	170*						
Chloroform							
1,2-Dichloroethane	5						
1,1,2-Trichloroethane	[5]						
Trichloroethene	5						
Tetrachloroethene	5						
Benzene	5						
Chlorobenzene	100						
Ethylbenzene	700						
Xylene (Xylol)	10000	1U	1U	1U	1U	1U	1U
Metals							
Total Arsenic	50	.12/.63	8.9/46	5/6	.11		
Dissolved Arsenic						10U	10U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-20 (Page 2)

Analyte (ug/L)	MCL	WCC 1989	WCC 1990	WCC 1991	WCC 1992	EPA Jun-92	WCC 1993
Herbicides							
2,4,5-T		U	.2U	.2U	.2U	NS	
2,4-D	70	U	1.2U	1.2U	1.7U	NS	
2,4,5-TP (Silvex)	50		.17U	.17U	.17U	NS	
Pesticides							
alpha-BHC			0.15	0.26/0.30	0.21/0.23	NS	
beta-BHC			.05U	.05U	.05U	NS	
delta-BHC			0.12	.1U/0.29	.05U	NS	
gamma-BHC (Lindane)	0.2	U	47/1.1	0.84/0.99	0.41/0.72	NS	
4,4'-DDD		U	.1U	.1U	.1U	NS	
4,4'-DDE		U	.1U	.1U	.1U	NS	
4,4'-DDT		U	.1U	.1U	.1U	NS	
Aldrin		U	.05U	.05U	.05U	NS	
Dieldrin		U	.1U	.1U	.1U	NS	
Endrin	2			NA	NA	NS	
Chlordane	2				NA	NS	
Heptachlor	0.4			NA	NA	NS	
Methoxychlor	40			NA	NA	NS	
Toxaphene	3			NA	NA	NS	
Volatile Organics							
Acetone				100U/250	U	3U	
Carbon Disulfide				U	50U	1U	
1,1-Dichloroethene	7			U	U	3 {4}	
1,2-Dichloroethene	170*			50U	50U	1U {1}	
Chloroform				U	U	1 {1}	
1,2-Dichloroethane	5			50U	50U	1U	
1,1,2-Trichloroethane	[5]			50U	50U	3J {3J}	
Trichloroethene	5			1500/2100	1500/4200	600J {400J}	
Tetrachloroethene	5			U	U	1 {1}	
Benzene	5			U	50U	1 {1}	
Chlorobenzene	100			5U	50U	2 {2}	
Ethylbenzene	700			U	50U	1U	
Xylene (Xylol)	10000	U	50U	5U/100U	50U	1U	
Metals							
Total Arsenic	50	6	5U	5U	5U	NS	
Dissolved Arsenic			5U	5U	10U	NS	

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-23

Analyte (ug/L)	MCL	WCC Nov. 1983	WCC Aug. 1985	WCC No data for 1986-1991			WCC 1992
Herbicides							
2,4,5-T		5U	1U				.8U/1U
2,4-D	70	5U	1U				4.8U/6U
2,4,5-TP (Silvex)	50	NA	NA				2.1/2.5
Pesticides							
alpha-BHC							0.33/0.41
beta-BHC							2/2.4
delta-BHC							0.48
gamma-BHC (Lindane)	0.2	11.1	0.17				0.36/0.37
4,4'-DDD		2.1	.1U				0.53/1.1
4,4'-DDE		1U	.1U				0.52/1.1
4,4'-DDT		1U	.1U				.4U/1.5
Aldrin		3	.1U				0.38/1.3
Dieldrin		4.7	.1U				2.4/2.6
Diazinon		NA	NA				NA
Endrin	2	.1U	.1U				.4U/0.73
Chlordane	2	5U	.1U				.5U/2U
Heptachlor	0.4	.1U	.1U				.05U/.2U
Methoxychlor	40	5U	5U				.5U/2U
Toxaphene	3	5U	5U				5U/20U
Malathion		NA	NA				
Parathion, Ethyl		NA	NA				
Parathion, Methyl		NA	NA				
PCB	0.5	NA	NA				
Volatile Organics							
Acetone							10U
Carbon Disulfide							5U
1,2-Dichloroethene	170*						5U
1,1,1-Trichloroethane	200						5U
1,1,2-Trichloroethane	[5]						5U
1,2-Dichloroethane							5U
2-Butanone (MEK)							10U
Trichloroethene	5						5U
Benzene	5						5U
Chlorobenzene	100						5U
Ethylbenzene	700						5U
Xylene (Xylol)	10000	1U	1U				5U
Metals							
Total Arsenic	50	9	1				28/50
Dissolved Arsenic		NA	NA				10U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-24

Analyte (ug/L)	MCL	WCC 1987	WCC 1988	WCC 1989	WCC 1990	WCC 1991	WCC 1992	WCC 1993
Herbicides								
2,4,5-T		1U	1U	U	.2U	.2U	.2U	
2,4-D	70	1U	1U	U	1.2U	1.2U	1.2U	
2,4,5-TP (Silvex)	50				.17U	.17U	.17U	
Pesticides								
alpha-BHC					0.056	.060/0.064	0.062/0.08	
beta-BHC					.05U	.05U/0.068	.05U/0.073	
delta-BHC					.05U	.05U	.05U	
gamma-BHC (Lindane)	0.2	.1U	.1U	U	.05U	.05U	.05U	
4,4'-DDD		.1U	.1U	U	.1U	.1U	.1U	
4,4'-DDE		.1U	.1U	U	.1U	.1U	.1U	
4,4'-DDT		.1U	.1U	U	.1U	.1U	.1U	
Aldrin		.1U	.1U	U	.05U	.05U	.05U	
Dieldrin		.1U	.1U/.63	U	.1U	.1U	.1U	
Endrin	2						NA	
Chlordane	2						NA	
Heptachlor	0.4						NA	
Methoxychlor	40		.5U	U			NA	
Toxaphene	3		5U	U			NA	
Volatile Organics								
Acetone						10U/13	U/23	
Carbon Disulfide						U	5U	
1,2-Dichloroethene	170*					U	5U	
1,1,1-Trichloroethane	200					U	5U	
1,1,2-Trichloroethane	[5]					5U	5U	
1,2-Dichloroethane	5					U	5U	
2-Butanone						U	10U	
Trichloroethene	5					5U	5U	
Benzene	5					5U	5U	
Chlorobenzene	100					5U	5U	
Ethylbenzene	700					5U	5U	
Xylene	10000	1U	1U	U	5U	5U	5U	
Metals								
Total Arsenic	50				5U	5U	5U	
Dissolved Arsenic		10U	10U	U	5U	5U	5U	

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-25

Analyte (ug/L)	MCL	WCC 1987	WCC 1988	WCC 1989	WCC 1990	WCC 1991	WCC 1992
Herbicides							
2,4,5-T		1U	1U		.2U	.2U	.2U
2,4-D	70	1U	1U		1.2U	1.2U	1.2U
2,4,5-TP (Silvex)	50				.17U	.17U	.17U
Pesticides							
alpha-BHC						.05U	.05U
beta-BHC						.05U	.05U
delta-BHC						.05U	.05U
gamma-BHC (Lindane)	0.2	1U/53	.1U	0.15	.05U	.05U	.05U
4,4'-DDD		.1U	.1U		.1U	.1U	.1U
4,4'-DDE		.1U	.1U		.1U	.1U	.1U
4,4'-DDT					.1U	.1U	.1U
Aldrin		.1U	.1U		.05U	.05U	.05U
Dieldrin		.1U	.1U		.1U	.1U	.1U
Endrin	2				.1U	NA	NA
Chlordane	2				.5U	NA	NA
Heptachlor	0.4				.05U	NA	NA
Methoxychlor	40				1U	NA	NA
Toxaphene	3				1U	NA	NA
Volatile Organics							
Acetone						10U	U
Carbon Disulfide						U	5U
1,2-Dichloroethene	170*					5U	5U
1,2-Dichloroethane	5					5U	5U
1,1,1-Trichloroethane	200					U	U
1,1,2-Trichloroethane	[5]					5U	5U
Trichloroethene	5					5U	5U
Benzene	5					U	5U
Chlorobenzene	100					5U	5U
Ethylbenzene	700					U	5U
Xylene	10000	1U	1U		5U	5U	5U
Metals							
Total Arsenic	50			9	5U	5U	5U
Dissolved Arsenic		10U	10U		5U	5U	5U

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-26

Analyte (ug/L)	MCL	WCC 1989	WCC 1990	WCC 1991	WCC 1992	WCC 1993
Herbicides						
2,4,5-T		10U	.2U	.2U	.2U	
2,4-D	70	20U	1.2U	1.2U	1.2U	
2,4,5-TP (Silvex)	50	NA	.17U	.17U	.17U	
Pesticides						
alpha-BHC		NA	.05U	.05U	.05U	
beta-BHC		NA	.05U	.05U	.05U	
delta-BHC		NA	.05U	.05U	.05U	
gamma-BHC (Lindane)	0.2	.05U	.05U	.05U	.05U	
4,4'-DDD		.1U	.1U	.1U	.1U	
4,4'-DDE		.1U	.1U	.1U	.1U	
4,4'-DDT		.1U	.1U	.1U	.1U	
Aldrin		.05U	.05U	.05U	.05U	
Dieldrin		.1U	.1U	.1U	.1U	
Endrin	2	.1U			NA	
Chlordane	2				NA	
Heptachlor	0.4	.05U			NA	
Methoxychlor	40	.5U			NA	
Toxaphene	3	1U			NA	
Volatile Organics						
Acetone				10U	10U	
Carbon Disulfide				U	5U	
1,2-Dichloroethene	170*			U	5U	
1,1,1-Trichloroethane	200			U	5U	
1,1,2-Trichloroethane	[5]			5U	5U	
1,2-Dichloroethane	5			U	5U	
2-Butanone (MEK)				U	10U	
Trichloroethene	5			5U	5U	
Benzene	5			U	5U	
Chlorobenzene	100			5U	5U	
Ethylbenzene	700			U	5U	
Xylene	10000	5U	5U	5U	5U	
Metals						
Total Arsenic	50	U, {10}	5U	5U	5U	
Dissolved Arsenic		U, {16}	5U	5U	5U	

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-27

Analyte (ug/L)	MCL	WCC 1989	WCC 1990	WCC 1991	WCC 1992	WCC 1993
Herbicides						
2,4,5-T		10U	.2U	.2U	.2U	
2,4-D	70	20U	.5U	1.2U	1.2U	
2,4,5-TP (Silvex)	50	10U	.17U	.17U	.17U	
Pesticides						
alpha-BHC		NA	0.12	.066/0.12	.05U	
beta-BHC		NA	.05U	.05U	.05U	
delta-BHC		NA	.05U	.05U/0.064	.05U	
gamma-BHC (Lindane)	0.2	.09/.11, { .05U }	0.14/0.22, { 0.15 }	0.12/0.23	.05U/0.066	
4,4'-DDD		.1U	.1U	.1U	.1U	
4,4'-DDE		.1U	.1U	.1U	.1U	
4,4'-DDT		.1U	.1U	.1U	.1U	
Aldrin		.05U	.05U	.05U	.05U	
Dieldrin		.1U	.1U	.1U	.1U	
Endrin	2	.1U	.1U	.1U	.1U	
Chlordane	2	.05U	.05U	.05U	.5U	
Heptachlor	0.4	.05U	.05U	.05U	.05U	
Methoxychlor	40	.5U	.5U	.5U	.5U	
Toxaphene	3	1U	1U	5U	5U	
Volatile Organics						
Acetone				5U	10U	
Carbon Disulfide				U	5U	
1,2-Dichloroethene	170*			U/9.8	5U	
1,1,2-Trichloroethane	[5]			5U	5U	
1,2-Dichloroethane	5			U	5U	
Trichloroethene	5			5U/10	5U/19	
Benzene	5			U	5U	
Chlorobenzene	100			5U	5U	
Ethylbenzene	700			U	5U	
Xylene	10000	5U	5U	5U	5U	
Metals						
Total Arsenic	50	3U	5U	5U	6.6/18	
Dissolved Arsenic		3U	5U	5U	5U	

Historical Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-28

Analyte (ug/L)	MCL	WCC 1989	WCC 1990	EPA Jun-90	WCC 1991	EPA Jun-91	WCC 1992	EPA Jun-92
Herbicides								
2,4,5-T		10U	.2U	.2U	.2U	3.9U	.2U	.2U
2,4-D	70	20U	.5U	1U	1.2U	15U	1.2U/1.5,{1.2U}	.5U
2,4,5-TP (Silvex)	50	10U	.17U	.2U	.17U	1.1U	.17U	.15U
Pesticides								
alpha-BHC		NA	1.8	1.6U	1.8/1.9,{1.5/1.8}	1.8U	1.8/2.1,{1.6/1.9}	1.9
beta-BHC		NA	.2U	.6U	.2U	.5U	.2U	.11U
delta-BHC		NA	0.36	0.14	.38/.53,{.34/.50}	.5U	.37/.39,{.33/.37}	0.43
gamma-BHC (Lindane)	0.2	7/4.1,{3.4/3.9}	3.5/3.9	3.2	3.2/4.1,{3.1/3.5}	3.3U	3.4/3.8,{3.0/3.5}	3.5
4,4'-DDD		.4U	.4U	.12U	.4U	1U	.4U	0.032
4,4'-DDE		.4U	.4U	.12U	.4U	1U	.25U,{.4U}	.006U
4,4'-DDT		.4U	.4U	.12U	.4U	1U	.4U	0.04
Aldrin		.2U	.05U	.5U	.2U	.5U	.2U	.004U
Dieldrin		.4U	.4U	0.12	.4U	1U	.4U	0.05
Endrin	2	.4U		.12U	.4U	1U	.4U	.02U
Endosulfan I						.5U		.009U
Endrin Ketone								.038U
Chlordane	2	2U	.2U	.5U	.2U	NA	.25U	.02U
Heptachlor	0.4	.2U			.2U	.5U	.2U	.009U
Methoxychlor	40	2U	2U	.6U	2U		2U	.01U
Toxaphene	3	4U	4U		20U	10U	20U	.5U
Volatile Organics								
Vinyl Chloride	2				U	10U	U	3U
Acetone				10U	5.1 {10U}	10U	10U	2U
Carbon Disulfide					U	5U	5U/6.8, {5U}	1U
1,1-Dichloroethene	7				U	5U	U	1U
1,2-Dichloroethene	170*				5U	5U	5U	1U
Chloroform					U	5U	U	1
1,2-Dichloroethane	5				5U	5U	5U	1U
Trichloroethene	5			5U	5U	5U	5U	1U
1,1,2-Trichloroethane	[5]			5U	5U	5U	5U	1U
Benzene	5				U	5U	5U	1U
Tetrachloroethene	5				U	5U	U	1U
Toluene	1000				U	5U	U	2
Chlorobenzene	100			5U	5U	5U	5U	3
Ethylbenzene	700				U	5U	5U	1U
Xylene	10000	17,{8.7/17}	5U	5U	5.1/8.4,{5.0/9.0}	5U	5U	4
Semivolatiles								
None Detected		NS	NS	NS	NS	NS	NS	U
Metals								
Total Arsenic	50	35,{3U}	5U/8.6	10U	5U	10U	5U	50U
Dissolved Arsenic		3U	5U/8.8	10U	5U	10U	5U	50U

Groundwater Data from the Ortho-Chevron Facility.

Well: OWC-29

Analyte (ug/L)	MCL	WCC 1992	EPA Aug-92
Herbicides			
2,4,5-T		.2U	I
2,4-D	70	1.2U	I
2,4,5-TP (Silvex)	50	.17U	I
Pesticides			
alpha-BHC		0.25/0.26	0.23
beta-BHC		.05U	0.005U
delta-BHC		.05U	0.008U
gamma-BHC (Lindane)	0.2	0.56/0.7	0.73
4,4'-DDD		.1U	0.06U
4,4'-DDE		.1U	0.006U
4,4'-DDT		.1U	0.01U
Aldrin		.05U	0.004U
Dieldrin		.1U	0.006U
Endrin	2	.1U	0.02U
Endosulfan I			0.009U
Endrin Ketone			0.005U
Chlordane	2	.5U	0.02U
Heptachlor	0.4	.05U	0.009U
Methoxychlor	40	.5U	0.01U
Toxaphene	3	5U	0.50U
Volatile Organics			
Vinyl Chloride	2	U	3U
Acetone		U	20U
Carbon Disulfide		5U	1U
1,1-Dichloroethene	7	U	1U
1,1-Dichloroethane		U	1
1,2-Dichloroethene	170*	31/34	1U
Chloroform		U	1U
1,2-Dichloroethane	5	5U	1U
Trichloroethene	5	6/6.4	6
1,1,2-Trichloroethane	[5]	5U	1U
Benzene	5	5U	1U
Tetrachloroethene	5	U	3
Toluene	1000	U	1U
Chlorobenzene	100	5U	1U
Ethylbenzene	700	5U	1U
Xylene	10000	5U	1U
Semivolatiles			
None Detected		NS	U
Metals			
Total Arsenic	50	5U	50U
Dissolved Arsenic		5U	50U

Notes:

Well drilled and first sampled in August 1992.